



FRIDAY, SEPT. 22, 1893

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Contributions.

Accident Record—Correction.

COLUMBUS, O., Sept. 11, 1893.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In your issue of Sept. 8, under the head of "Derailments," page 671, you refer to an accident on the Cleveland, Akron & Columbus on Aug. 19, as caused "by spread of rails." This is an error. It was due to the breaking of a brake-head, which was caused by the sudden application of the brake when running at high speed.

W. M. KIRKBY,
Commissioner of Railroads and Telegraphs.

Rubble Concrete.

NEW YORK, Sept. 13, 1893.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The article under this heading in your issue of Sept. 8, p. 663, omits mention of the two most important points in bedding large stones in a mass of concrete, to-wit: that every stone shall have one flat bed on which to be laid in mortar, and that it shall be roughly conical or pyramidal in shape, so that when placed no part shall overhang another. The size of the stones used in a large mass of concrete is not material. As concrete is usually rammed in layers about 8 in. deep, the writer has used such as would be covered by the layer and not disturbed by the ramming. In the Vrynyw dam Mr. Deacon bedded stones of $1\frac{1}{2}$ to 6 and 7 tons, but of somewhat conical form, exposing his work thereby to Mr. Thomas Hawksley's remarkable criticism, that they had a tendency to split the dam.

In the experience of the writer the practice does not greatly reduce the cost of the mass of concrete. Mr. J. W. Steven, however (vol. exii., p. 229, Proceedings Inst. C. E.), finds a saving of about 20 per cent.

W. R. HUTTON.

The Electric Motor Tests on the Manhattan Elevated.

NEW YORK, Sept. 20, 1893.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In the *Railroad Gazette* of the 15th inst. appeared an editorial on the future motive power for elevated railroads, in which it is stated that the electric locomotive tried on the Manhattan had about 2,000 lb. maximum drawbar pull against 8,000 lb. hauling power of the steam locomotive. You have been misinformed on that point. It was my privilege to determine the capacity and efficiency of that motor and plant for the Manhattan Railway Co., and the maximum drawbar pull was 4,500 lb. on a dynamometer which had just been received from the maker and adjusted by Mr. Daft's engineer. The locomotive selected for competition is one of the lightest in use on the system, with a maximum of 125 I. H. P., against 128 H. P. for the electric locomotive by Prony brake test made by Mr. Daft. The standard Manhattan locomotives will develop 300 I. H. P. maximum.

The "unfortunate and badly arranged trial" extended over a period of about two years, in which time the whole plant was rearranged and the line and locomotive entirely rebuilt. Trials were made in different ways, express and local, and with trains of 10 empty cars upward.

Although Mr. Daft and the eminent electricians connected with the enterprise failed to make a commercial

success of the "Benjamin Franklin," their efforts deserve the respectful consideration of all engineers.

With reference to elevated railroad speeds, the rate of 47 miles per hour is sometimes attained with 42-in. drivers.

As regards the strains produced by possible electric locomotives, it is possible to construct electric locomotives of greater power than the usual Forney locomotives used for elevated railroad service that will not increase the tensile and compressive chord strains and will not materially add to the column loads.

LINCOLN MOSS, P. A. Eng. M. Ry. Co.

Concerning Compound Locomotives.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In an editorial in the *Railroad Gazette*, July 28, page 508, speaking of the Lake Street Elevated Railroad compound locomotive you say there is no service except heavy freight work so well adapted to compounds. Mr. S. M. Vauchain, at the time of the Master Mechanics' Convention, took exception to statements of this kind and claimed that compounds were suitable for all kinds of work. Now I have had nine months' experience in handling trains drawn by a compound and would like to give you a few facts against these claims. My road owns four compounds, two freight and two passenger, also some simple consolidation engines 10 or 12 years old. The simple consolidations weigh 102,000 lbs., with 88,000 lbs. on drivers and steam pressure 150 lbs.; they will carry 21 or 22 loads over a 52-ft. grade, 5 miles long, in 35 to 45 minutes. The compounds weigh 123,000 lbs., they are also consolidations, with 105,000 lbs. on drivers, steam pressure 180 lbs. Now, it seems to me that the compounds ought to pull two more cars than the simple engines, but they only haul from 16 to 18 up the grade; but they can run fast on lighter grades and on level sections.

Now, the question I want to ask is, What does a saving of 30 per cent. in coal amount to when coal sells for \$1.10 a ton, while freight averages from \$10 to \$50 a car, if the compounds are to pull from 3 to 5 cars less per train, meantime weighing considerably more than the simple engines?

Our compound passenger engines are 10-wheelers, weighing about 120,000 lbs., and give better satisfaction than the freight engines, from the fact that they can take a 7 or 8 car train and run over a 90-mile division without stopping for water. But the old 10-wheelers, single expansion, stop only once for water and work quicker on the grades. Now, why is it that the old engine should be quicker than the compounds?

From an operating standpoint I want to ask, If these compounds break down on one side, can they haul in to a terminal about one-half the load in the same way as a simple engine can do it? Is it the same for 2 and 4 cylinder engines?

TRAIN DESPATCHER.

[Some remarks on these engines will be found in the editorial columns.—EDITOR.]

How to Fire a Locomotive.

BOSTON, AUG. 14, 1893.

TO THE EDITOR OF THE RAILROAD GAZETTE:

After watching a considerable number of firemen I am convinced that the proper firing of a locomotive is a very simple matter and something that any able-bodied man can properly acquire if properly instructed. There are numerous firemen, so called, that go through the firing service to the engineer's side who have never known how to fire properly. Take illustration: A fireman had been firing four years and was considered to be fairly good man and in the line of promotion. His trip was with seven cars, 45 miles an-hour schedule, a first-class modern locomotive, carrying 180 lbs. steam pressure, a practically level road and conditions excellent. This fireman's method was such that the pressure, while in motion, varied from 95 to 125 lbs. One No. 9 injector was applied continuously and the second injector at times. The fireman worked hard with shovel and used hook and bar occasionally. A look in the firebox revealed what is termed a "haycock" fire, i. e., high and black in the middle and under the door, very low and white at front and sloping toward the side sheets, with consequent over supply of air in places and insufficient air in others. Result, low steam, lots of smoke, hard work for the fireman and needless waste of fuel. At stations where stops were made the blower was applied to raise the pressure. While climbing grades the injectors had to be shut off and the water line lowered so as to retain the pressure. When nearing the terminal the fire was allowed to burn low, thereby brightening it up. The writer found the locomotive standing in the train house when passengers were departing, with three gauges of water, howling at the pop-valves, damper open, fireman trying to blacken the fire with green coal and the engineer trying to crowd a little more water into the boiler, to the evident discomfort of all. It is not necessary to mention the difficulty and annoyance in trying to put the train away with a boiler full of comparatively cold water.

The writer has had excellent satisfaction with the following method of firing soft coal on heavy, fast passenger trains: A fire in a locomotive firebox should be concave and bright, i. e., highest at sheets and lowest in the middle. As the temperature at the sheets is always too low for complete combustion it is best to bank coal against them

where it will get coked and roll into the middle or white fire. The gases generated at the sheets are to a great extent consumed over the bright centre fire while passing to the tubes. Start with about 12 in. of clean, bright fire uniformly distributed over the grate, only the back damper open and the ash pan clean; let the fire brighten up for half mile out, then, with coal well broken and wet enough to alight the dust in handling, fire frequently and lightly, not more than two scoops at a time. Beginning with the brightest spot aim to fire in different portions of the box as follows: Right-hand front corner; left-hand back corner; left-hand front corner; under the door; against the front sheet; along the side sheet, etc., keeping the general contour of the fire concave. With such a fire nearly the requisite amount of air is obtained just where it is wanted, that is, in the middle of the fire, and not at the side sheets, where it would chill the firebox and retard combustion. The jar of the locomotive will be sufficient to keep the low places filled and will keep the ashes cleared out in the middle; the sheets will be kept well covered so that cold air cannot rush up between them and the fuel. The air will pass through the part of the fire where it will get heated sufficiently to combine with the gases, thereby producing as near perfect combustion as can be attained in the ordinary locomotive firebox. Make it a point not to replenish the fire in the vicinity of stations or when the runner shuts off steam, and then by applying the blower slightly sufficient air can be drawn through the fire to consume the smoke without raising the pressure too much whenever a stop is made.

If through some irregularity or inadvertence a stop should be made with a green fire, steam at or near the popping point and no available room in the boiler for water, by closing the dampers, starting the blower and opening the fire door, the popping and smoke can be avoided. We start out again, keeping the door on the latch until the runner has hooked up so as not to tear the fire; then the door can be closed if the fire is light enough to admit sufficient air to consume the smoke; if not the slide in fire door must be opened or the door kept partly open.

When about ten miles from the foot of a two-per cent. grade which has to be run on schedule time, so that we shall have to increase the feeding of fuel, open the front damper and close the back one, so as to supply larger quantities of air to get the heavier fire in condition to withstand the increased demand and draft when the runner drops down the reverse lever. Nearing top of the hill let the fire burn low, aiming to get it back to its normal condition, keeping it bright in case the runner desires to feed water while drifting or working light down the other side. By this time the fire has got so clogged with ashes, etc., that it requires the front damper to drive sufficient air through the fire.

Approaching the end of the division let the fire burn low, closing dampers, and let the steam pressure fall to the vicinity of 100 lbs. (sufficient to put train away if required). When terminal is reached there will be an entire absence of smoke from the stack and of steam from the dome, which is so disagreeable at terminal stations while unloading passengers, baggage, etc., besides being wasteful.

Backing to the enginehouse, the top door should be kept closed so as to prevent cold air passing through the flues, and when ashpit is reached the fire should be cleaned carefully. At no other place should the grates be shaken unless absolutely necessary. An accumulation of ashes in the pan will cause burning out and warping of the grates, obstruction to draft, danger of setting fire when damper is open on the road, etc.

A fireman manipulating his fire as outlined above will very rarely have occasion to use the bar or hook on the road, the use of which tends to break up the fire, allowing the small incandescent particles to go through the flues to the front end and stack; it also causes choky fire, clinkers, etc. The firedoor and ashpan dampers should be kept as near closed as is consistent with the demands of the fire; as any neglect in this respect not only increases the quantity of fuel consumed, but adds to the labor of the fireman and to the cost of operation. An occasional locomotive will be found to burn and tear the fire more in front than in the back of firebox or *vice versa*. This can be easily remedied by lowering or raising the baffle plate, or petticoat pipe, until the draft is uniform in all the flues.

A fireman who works in this way will have no trouble getting sufficient steam unless something is radically wrong; and he can console himself with the knowledge that he is one of the best firemen on the division, performing his duties with less labor and in a more satisfactory manner than his associates.

H. D. L.

Two Dining Cars.

Some examples of dining car construction and equipment are shown in the accompanying engravings of two cars lately built. They furnish good illustrations of the admirable manner in which an American car, constructed upon general lines, may be converted to especial purposes. Figs. 1 and 2 are exterior and interior views of a new dining car built by the Wason Manufacturing Company for the Delaware & Hudson Canal Co. for summer service in the Adirondack region. Fig. 3 is an interior of a dining car for the Atchison, Topeka & Santa Fe, and was built by the Barney & Smith Car Company. Both cars are furnished with movable tables and

chairs; and, although built for dining cars, they may be changed on short notice to ordinary first-class passenger cars by removing the tables and chairs and putting in seats, or with little expense they may be converted into excursion or business cars.

The interior furnishings of both cars have new and attractive features. The D. & H. car is 62 ft. long and 9 ft. 8 in. wide, finished outside in dark green with gilt trimmings. Inside at one end is a marble wash basin and linen press, and at the other a kitchen 14 ft. long by 7 ft. wide, and a pantry 12 x 9 ft., with wine and fruit closets, a refrigerator and cold storage for butter and ice cream. The corridors along the ends are finished in mahogany. The dining-room proper is 25 ft. long, fitted with eight tables, for the accommodation of 32 people.

These tables are oak of a light modern pattern, and portable. At each table there are four antique oak chairs, between which there is plenty of room. The interior is beautifully finished in old colonial style with hand-carved quartered oak frames around plate glass mirrors.

The adoption of silk for a car ceiling is perhaps new, at least it is claimed that this is the first instance where silk has been used for the purpose. It is of light blue and gold brocaded silk and the rich effects produced, especially at night are highly satisfactory, more so than could have been secured with a decorated wood ceiling. The floor is furnished with a heavy Wilton carpet, selected to harmonize with the ceiling and trimmings.

The lamps are a new pattern, manufactured by Howard & Co., of Hartford, Conn.

Another interesting feature of the car is that of the double windows. There has always been trouble in keeping the interior surfaces of double windows clean; the difficulty being to get at them. To render both sides of both sash easy of access, the inside sash is so hung that it can be swung on pivots near the top at right angles to the outside pane of glass, exposing both surfaces of itself and allowing free access to the outside sash. The arrangement seems a good one. The window is stopped by a metallic projection on each side, which engages in a short groove in the sash stile, and which allows the sash to be raised about three inches. To open the window these metallic projections are turned back into the window frame by a key carried by the porter. The projections being depressed the sash may be swung on the pivots before mentioned.

The Atchison car shows another style of decoration. It is of the Byzantine style of interior architecture. The inside is finished in antique oak and trimmed with Persian brass. The lamps are in keeping with the general style and are a late pattern of the Dayton Manufacturing Company.

The car is carpeted throughout with Wilton carpet and the loose rattan chairs are upholstered with leather. The ceiling is beautifully decorated in relief and is hand painted. The windows have shades of the small diamond tapestry pattern, and are fitted with double outside and inside sash, glazed with polished plate glass. A careful look at the engraving will be necessary to see the wrought handwork, the columns and the minute details of their capitals, as well as the panel work. This car seats 23 persons.

These cars are inviting and convenient and afford accommodations more like those of a first class dining-room than the old style. It will be a relief to a person above or below the medium size to have a seat at dinner that he can place to his own comfort and convenience. The ordinary dining-car seat is too much like a one-sized coat for every man. If a man ever wants to be comfortable it is when he eats and sleeps.

The Car and Locomotive Painters' Association.

The Master Car and Locomotive Painters held their twenty-third annual convention at Milwaukee, Wis., opening Wednesday, Sept. 13, with an address from President Wm. O. Guest, who spoke of the growth and prospects of the Association, and urged the members to give their attention to the several important subjects before them for discussion.

The Secretary called the roll of members and 83 responded to their names. The report of the Secretary and Treasurer showed the growth since the last meeting in Detroit; the gain in membership was 10, making the present membership 163.

The Committee on Tests presented a valuable report

showing careful study and experiment on the several vehicles and pigments employed in car painting.

The following officers were elected for the ensuing year: President, Wm. J. Orr, Buffalo, Rochester & Pittsburgh; First Vice-President, W. T. Leopold, Central Railroad of Georgia; Second Vice-President, Thos. H. Cornish, Southern Pacific; Secretary and Treasurer, Robt. McKeon, New York, Pennsylvania & Ohio, Kent, O.

The discussion of subjects was taken up when F. S. Ball, of the Pennsylvania, and J. G. Keil, of the Chicago & Alton, presented their reports on "The Classification of Paint Shop Repairs on Passenger Cars," after which a discussion followed, and the sense of the meeting was that the work should be divided into five classes, according to the amount of repairs given the car in the woodshop and the condition of the paint when turned over to the painter.

The preparation of cloth head linings for passenger cars was presented in reports from Edward Webb, of the Laconia Car Co., and M. L. A. Gardner, of the Wilmington, Columbia & Augusta Railroad, which brought out some methods of preparation different from those

tanks should be heated by the application of steam (or hot air, which is better) on the inside, to drive out the moisture under scales; the paint then adheres closely to the metal. Mr. Wright rubs the tank thoroughly with a piece of broken emery wheel, then with sandstone. This removes rust and scale and takes the glaze from the iron. After rubbing he washes with turpentine. He uses the same method with both steel and iron tanks. The general sense of the meeting was that there is nothing that is better than the rubbing thoroughly with emery stone and kerosene oil.

Subject No. 6 was: Cutting in a Passenger Car with Body Color—Do you mix the same way as when giving it a general painting? Jno. A. Rutz, of the Wisconsin Central, and Fred Johnson, of the Chicago, Burlington & Quincy, presented reports. After the reading a long discussion was entered into and a large amount of information brought out. The consensus of opinion was that the condition of the old paint on the car must determine the material to be used in mixing. If a car has a good surface with some varnish yet remaining, then one quart of finishing varnish to 10 lbs. of body color should be used, but if the car was dry a less quantity of varnish, but in

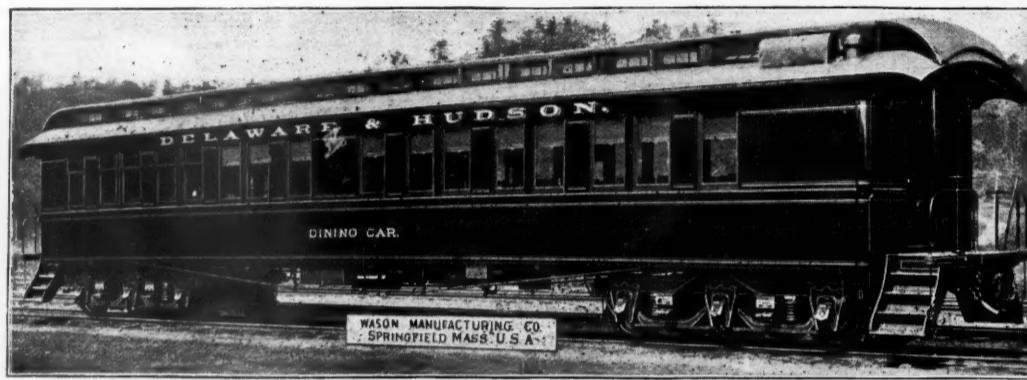


Fig. 1.—Dining Car of the Delaware & Hudson Canal Company.



Fig. 2.—Interior of Delaware & Hudson Dining Car.



Fig. 3.—Interior of Atchison, Topeka & Santa Fe Dining Car.

used by a large number of the members. The subject was well discussed, the first aim being to give the cloth elasticity to avoid cracking.

The third subject was a paper read by Secretary McKeon, entitled "Progress in Car Painting Due to Organized Association." Mr. McKeon treated this from a practical experience in the car shop, where he had been since boyhood. He claimed that what progress had been made was due to the labors of the Association, which had been working in harmony to advance the art of car painting for 23 years.

The next subject was: The Method of Preparing a New Steel Tank for Painting: How Should the Scales and Rust be Removed from a Common Iron Tank? Papers were presented on the question by L. A. Little, of the Pennsylvania; A. I. Horton, of the Lake Shore & Michigan Southern, and F. W. Wright, of the Michigan Central. The papers and discussion which followed brought out the fact that steel tanks were giving more trouble by rusting and scaling than the common iron tanks which were used altogether in years past; but iron tank sheets should be rolled and rerolled by the boilermaker in order to break the scales before the sheets are placed in position. Mr. Horton said steel for tanks did not need the rolling, but if tanks are rusted rub down with sandstone and kerosene oil, then wash with soap and water. Iron and steel

in all cases where cutting in a car a small portion of varnish was better in the Japan color, as it gave a more solid foundation for varnish coats.

Subject No. 7 was "How should natural wood doors and sash be finished so as to best stand the action of the weather?" Reports were read by W. W. Roahl, of the Southern Pacific; E. A. Cole, J. G. Brill Car Co., and J. C. Smith, of the C. C. C. & St. L. The reports and the discussion which followed stated that the decay of sash was not due to the painter, but was in the fitting of new sash; the bottom edge having to be refitted after painting, absorbs dampness and decay takes place. Water also gets under the beading of sash and doors and finds its way into the joints. The remedy is to give the rabbit of the sash and the beading several coats of the filling and varnish before the glass is put in. Doors did not give so much trouble as sash, and when properly filled and varnished on properly seasoned material they should wear satisfactorily.

The queries brought out considerable discussion; the most important was, Is it advisable to discontinue the use of white lead on passenger cars? It was decided that nothing had yet been discovered as a substitute, therefore it could be dispensed with only partially.

In changing the ornamentation of a passenger car what method will effectually remove or cover up the old striping? The best plan is to remove the old paint.

from the entire car body by burning or otherwise; this only would give satisfactory results.

Is it economy to paint the inside of a locomotive tank? This was decided in the negative by the almost unanimous voice of the meeting. The paint that is put on the inside of a tank is entirely worn off in 30 days by the continual motion of the water; all that remains may be a little around the rivets; and, further, the paint is of no benefit after it is broken.

What priming can we use on galvanized iron to overcome flaking or scaling off? First, the iron should be scoured to remove the glaze, then prime with red lead mixed to dry with an egg-shell gloss.

By unanimous expression it was decided that the inside of a locomotive cab should be painted a medium shade of green, and the question Is it economy to varnish the inside of baggage, express or mail cars was discussed, some difference of opinion being expressed; but it was generally considered best to varnish the ceiling, and paint the side walls with varnish color, in baggage and express cars. In mail cars the ceiling should be painted white, and the sides grained and varnished.

An invitation was received to attend the exercises at Festival Hall and other points of interest at the World's Fair grounds on Railroad Day, Sept. 16, which was unanimously accepted, and the Association attended in a body, adjourning at one o'clock Friday, so that all might have an opportunity of attending and participating in the celebration of Railroad Day. By vote of the meeting, it was decided to hold the next annual convention in Buffalo, N. Y.

Port Los Angeles Wharf.

The city of Los Angeles is supposed by most readers, to be situated on the Pacific Ocean. The fact, however, is that the original Spanish founders placed it about 18

was at once commenced on a long pier or wharf. This has now been completed and thrown open to traffic. Its length is unusual, being 4,593 ft., probably the longest ocean wharf in the world. It is 131 ft. wide at its outer end. Accommodations are provided for eight ships at a time. The minimum water at low tide for the ships is 28 ft. Large coal bunkers are provided at the seaward end for the reception of Australian coal, which comes here in large quantities, as well as smaller lots of the Washington State coal. Southern California is entirely dependent on outside coal, as none is found within its own borders.

From the accompanying illustration it will be seen that the wharf extends from the beach directly out to sea, and is in no way protected by breakwaters or other devices. This has only been rendered possible by more than usual solidity of construction and bracing, together with the further fact that the Pacific preserves a more equable temper than the more riotous Atlantic. This same wharf, if built on the Atlantic seaboard, could probably not be maintained, and if not itself washed away, it would be impossible for vessels to discharge cargo during many parts of the year. The lumber used in construction was all from Oregon. All the piles were creosoted, as otherwise the teredo in these waters would destroy the timbers in a short time.

The Traveling Engineers' Association.

The first annual meeting of the Traveling Engineers' Association was held at Hotel Hayes, Chicago, Sept. 12 and 13, and 59 of the 109 members were present, and applications for memberships were received from 40 other traveling engineers.

President C. B. Conger's address delivered on the morning of Sept. 12 indicates partly the work to be taken up by the Association in its efforts "To improve

purposes above the running board should be saved by the firemen and supplied to the roundhouse wipers for cleaning below the running board.

The Committee, consisting of J. D. Vantwood, N. M. Maine and W. A. Murdoch, that investigated the different methods of examining firemen for promotion and new men for employment, reported substantially as follows: A list of 19 questions was sent to the various railroads, and replies were received from 30; the recommendations of the Committee were guided considerably by the views expressed by the majority of the representatives of the 30 roads. Thirty-four of the 30 examine firemen on machinery and ability to handle it before promoting them to engineers; the other two favored this, and the Committee recommended its adoption. Twelve use the progressive form of examination, and 24 do not use it; the Committee recommended the progressive form, as it enables the men to attain the desired end by easy stages. Thirty-four examine on various kinds of "breakdowns," and how to get the engine to the shop after a breakdown; the other two favored it, and it was thought necessary by the Committee that engineers should know how to get disabled engines to the shop as quickly as possible, and examination on this was recommended. Thirty-six examine applicants in reading and writing, and a few in arithmetic; it was recommended that they have at least a common-school education. Seventeen examine engineers hired from other roads the same as firemen for promotion, seven accept the recommendations from roads where previously employed, four do not hire engineers, but promote their firemen, eight examine on the air-brake only; it was recommended that such engineers be given the same examination that is given firemen for promotion. Seventeen do not have a set form for examination, and the same number do have; a set form was recommended to be used for all applicants. Fourteen examine applicants for positions as firemen, and 22 do not; the Committee thought that the applicant should be examined sufficiently to make sure that he could read and write. Thirty-five examine on air-brake practice, and the Committee recommended the education and examination of men on air-brake practice, to be done with sectional parts of the apparatus in a place arranged for the purpose or in actual practice and the examination to be aided by a regular form of questions. Twenty-four examine for color-blindness and vision, and 10 do not; on some of the 24 the traveling engineer makes the examination, on others the train department, and on others oculists are employed; the Committee thought it necessary to examine for color-blindness and vision. On 30 roads the train department conducts examinations on time-card and rules, and this method was approved. In regard to age limits for new men, youngest and oldest, 10 have no age limits, and on the other roads the limits vary, the lowest being 18 to 27, and the highest 21 to 45; the Committee recommended the limits be 21 and 26, and in the case of persons of experience the limit be fixed at 30 years. Twenty-eight have verbal examinations and eight have written; it was the opinion of the Committee that the verbal examination consumed less time, and was therefore the better. On 16 roads ability is considered paramount to seniority, and 19 consider seniority first, provided the necessary examination has been passed; it was recommended that the men should be examined according to their rank in employment, but should a younger man pass and an older fail the younger should rank first.

Answers to the question, "How do you determine the relative standing of men examined?" were very unsatisfactory. It was recommended that the percentage of questions answered determine the standing. The examination is conducted by the traveling engineer on 16 roads, by a board of examiners on 12, by the superintendent of motive power or master mechanic on 7, and on 3 a disinterested party constitutes the board; it was recommended that the board consist of the traveling engineer, the master mechanic and a disinterested third party acceptable to the first two members of the board and the applicant; further, that, when examining on the air-brake, the air-brake instructor take the place of the traveling engineer. The officers of 23 roads consult the engineers concerning the ability of the fireman, and on 14 roads this is not done; it was recommended that the engineer be consulted as a further incentive for the fireman to do his work properly and please his engineer; care should be taken, however, to make sure that personalities do not influence the judgment of the engineer. Nineteen roads issue certificates to candidates passing a mechanical examination, and 16 do not issue such; it was thought that certificates should be given in such cases. On 30 roads a second examination is given if the first is a failure, and on four the second examination is not given; the committee recommended that the second examination be given, but not until three months after the first one.

The committee also recommended that a committee be appointed to prepare a progressive form of examination for the various roads and to present a form of certificate to be given men who have passed a satisfactory examination.

The committee appointed to report on "safe and practical handling of air-brakes in all kinds of service" consisted of J. E. Goodman, M. M. Dodel and George Holmes. The report gives some statistics on the number of air-brake instruction cars and plants, the methods



Ocean Wharf of the Southern Pacific Railroad, Port Los Angeles, California.

miles inland. Although, geographically on the Los Angeles River, this river will forever remain valueless as a traffic-way, even to rowboats. It is one of those California rivers which Mark Twain characterized as having the river bed on top and the water below; in short, it is apparently dry during the long dry season. As there is therefore no means of water transit to the coast, railroads have been constructed to the neighboring ports of San Pedro, Redondo and Santa Monica. These are all termed ports, but they are in no sense harbors, and all are little better than open roadsteads. In the entire coast line of California, from San Francisco to the Mexican boundary at San Diego, a distance of more than 600 miles, there is no harbor.

Los Angeles with its large shipping trade is therefore without proper harbor facilities. The railroads, alive to the opportunities of creating or profiting by large freight transfers, have each undertaken to provide wharves and other loading and unloading appliances for the accommodation of the maritime traffic. The port of San Pedro would appear to be the natural site for a harbor to constitute the port of Los Angeles, but although the contour of the bay at this point is satisfactory to form a small harbor, the amount of dredging required will be enormous. Private capital cannot undertake it, and the government moves slowly, while the railroads are reaching for the sea trade which already exists and which must be provided for. The Southern Pacific Company with its large wharves and other terminal facilities at San Pedro has been waiting more than ten years for the harbor to be dredged to a depth sufficient to allow the usual draught of freight and passenger steamers to pass in and up to its docks. At last, without further waiting, this company decided to create an entirely new port and to so place it as to be forever independent of harbor dredging. A location about four miles north of Santa Monica was decided upon. Here work

the locomotive engine service of American railroads." The Association will consider only such subjects as fall within the duties of the traveling engineer. It was pointed out that such an officer of a railroad can do much in preventing wastes of engine supplies and in keeping the cost of running repairs as small as possible. It was the opinion of the President that whereas the traveling engineer was looked upon as a luxury by some roads a few years ago, nevertheless the office has become a fixture, as evidenced by the fact that there are more than 500 traveling engineers employed by the various roads at present.

Reports of the various committees appointed to investigate different subjects were presented and discussed. The reports are condensed below, and abstracts of the discussion will be given in a succeeding issue.

The Committee consisting of M. M. Meehan, J. S. Bauder and W. E. Miller reported as follows on the "Economical Use of Oil and Supplies:" Engines should be kept clean; if the railroads do not interest themselves in cleanliness and economy, the engineers cannot be expected to look carefully to the little losses. The traveling engineer should know that all oil cans are in good repair, that hand oilers have sufficiently long spouts. A squirt can should be used for oiling the small holes in the links, and automatic feed cups should be used on all bearings. Much economy results from the adoption of such appliances. There is no economy in using a poor grade of oil. The use of cylinder oil on machinery should not be allowed. It is not considered good policy to pay premiums for economy in oil and other supplies, for on all roads there are men who will use unfair means of obtaining supplies to get the premium; it is much better to appeal to a man's pride. Under ordinary conditions an engine will run from 75 to 100 miles with one oiling, and when pooling is practiced limiting the amount of supplies per 100 miles is the best method to adopt. Waste used for cleaning

of instructing and examining engineers and firemen in the use of the air-brake. The recommendations made by the committee considerably condensed are: There should be a man especially appointed to act as a traveling air-brake expert to reach all employees who are in any way connected with the handling of air-brakes. He should be competent to give instruction, both in the theory and practice of the air-brake on both engines and cars.

The expert is of more importance than a plant or car, but that with either he can accomplish so much more, that a road of any pretensions whatever cannot afford to do without either the car or stationary plant. That while an expert is indispensable, the car can be considered only as an adjunct and its importance is measured by the amount of work to be done, this work varying with the length of road. There is more work to be done outside the car to complete the instructions than inside. It was recommended that the different air-brake companies be requested to furnish sketches or models of their valves and intricate parts, similar to the brake valve drawings sent out by the Westinghouse Air Brake Co. in their instruction books. That air-brake defect cards be used both to keep account of repairs and to instruct the train crews, who should be obliged to make their reports on them.

It was decided that the next annual meeting would be held in Denver, Col. The questions to be discussed at that meeting will be "The true and false economy in caring for, and safe handling of air-brakes under all conditions; for examining firemen for promotion how severe an examining on airbrakes should be pass before being allowed to take out an engine?" "What are the best methods of saving coal and keeping the fuel mileage within reasonable bounds," and "What relation do clean engines bear to economical use of engine supplies?" Committees will be appointed to report on these subjects, and the reports will be discussed at the meeting.

The officers elected for the year are: President, C. H. Couger; Vice President, J. A. Goodman; Second Vice President, R. D. Davis; Secretary, W. O. Thompson; Treasurer, W. E. Miller; Member of Executive Committee, Michael Meehan.

Locomotive Cylinder Lubricator.

The introduction of oil into steam chests and cylinders has been made the subject of considerable study. Master mechanics and engine drivers know the difficulties attending the operation, and will hail with delight any device that promises to lubricate those parts thoroughly and un-

failingly. The Lackawanna Lubricating Company, of Scranton, offer a lubricator which has been in service for more than two years. It has been withheld from the market to perfect it and the tools for its manufacture, and is therefore new to the public.

The lubricator was suggested by an experiment, described as follows: To a steam pipe, fig. 1, was attached two lubricators at *A* and *B*, one of a well known type in which the oil is passed in large drops through water and floated through the connections to the steam pipe; and the other a design which sprayed the oil in steam before feeding it into the steam pipe. From the under side of a horizontal portion of the pipe at *C*, 16 ft. from *A* and *B*, a tube was inserted, which extended to within 2 in. of the top of the pipe. The lower end of this tube was connected with a pet cock. When oil was fed into the pipe by the cold-drop lubricator in the regular course of business, and the pet cock was opened, no trace of oil could be discovered in the jet of steam that escaped; but when the hot spray lubricator was used the steam drawn from the pet cock was saturated with oil. From this experiment the inventor was convinced that in the first instance the oil traveled sluggishly along the bottom of the pipe, and in the latter it mixed with the steam and was carried to every part where the steam went.

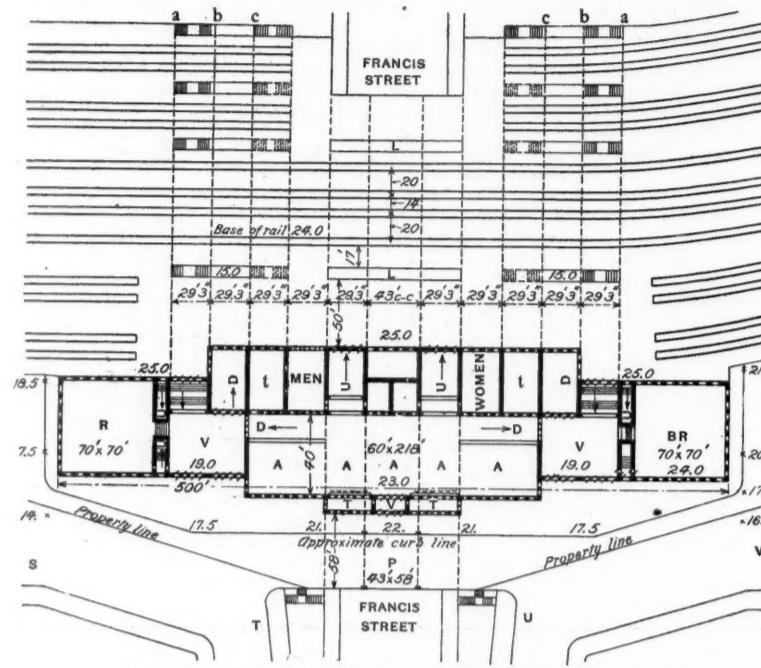
Acting on this conclusion, the company has perfected a lubricator which feeds to the steam chest and cylinder a lubricating vapor, a combination of sprayed oil and hot steam; a vapor that mixes with the working steam, travels with it, and is under the same pressure. A vapor that will travel by itself through the pipes and valves when the throttle is closed, as when the locomotive is coasting. From this property of the lubricant two chief

results are obtainable: First, the work of the lubricator does not depend upon steam from the throttle, and, second, both cylinders can be lubricated from one feed glass. The first will be apparent from a description of the lubricator.

The lubricator consists of two pear-shaped brass reservoirs, fig. 2, joined together by pipes with double connections and a glass tube, as shown in the illustration.

various details of the plan have been simplified in consequence of the control coming into the hands of a single company.

The new station is to be built on what was formerly the Cove, this basin having been filled in with gravel, and it will be about 600 ft. northwest of the present Union station. The distinctive feature of the location is the passage of a street directly under the middle of



Plan of Proposed Union Passenger Station at Providence, R. I.

References.—*A*, main waiting room; *R*, restaurant; *BR*, baggage room; *T*, ticket offices; *t*, toilet rooms; *V*, vestibules; *L*, light shaft for street; *a a*, abutment line; *P*, port cochere; *T S* and *U V*, inclined approaches up from Francis street. Inclined plane passage ways are distinguished by arrows and by the letters *D* and *U*; *D* for down and *U* for up.

Figures shown with a decimal point indicate elevations above datum.

The lower bulb is the oil cistern, *E* is called the condenser, *K* is a connection with the boiler, *H* goes to the cylinders or dry pipe and carries the lubricant, *C* regulates the quantity of oil, *D* is a spray valve and *B* a water valve. *A* and *L* are screw plugs; *A* being the filling plug where oil is poured in and *L* means for inserting new glasses. The apparatus is supported at *G* by a bracket support. The lubricator is filled and started in the following manner: Close valves *B* and *C*, unscrew plugs *A* and *F* to let lower bulb drain, then close drain-cock *F* and fill with oil through *A*; open water-valve *B* and oil-valve *C*; the water from the condenser *E* settles to bottom of oil cistern and the oil rises in glass; the steam, passing through *K* through an annulus in the valve *D*, sucks and sprays the oil into *H* and by it to the dry pipe and cylinders.

The oil is sprayed by being driven through the small annulus under the impulse of hot steam of full boiler pressure from the dome; and being in the form of a vapor is carried to the steam chest, when the throttle is closed, by the suction of the cylinders if the locomotive is running. The sprayed oil having the full boiler pressure behind it and both steam chests being connected by open branches of the dry pipe, there is no reason why as much lubricating vapor should not go into one as into the other cylinder. The impulse or suction of the cylinders being alike, and so rapid that the differences are instantaneously equalized by the open connections, they will draw equally of the lubricating vapor. This being so, the need of more than one feed glass is not apparent. Two years of hard service upon 20 locomotives has proved the uniform lubrication of both cylinders to the entire satisfaction of the railroads using them and of the company.

The company claims for the lubricator the following desirable features: Absolute uniformity of feed at all times; equal distribution to both cylinders with but one feed glass, which is almost unbreakable; no trouble with clogged passages, as they are easily blown out with steam; economy of oil, and less wear of cylinder and valve gear; simplicity of design with one-half the usual number of parts; all parts interchangeable and carried in stock. The lubricator is adjustable to the pipes and brackets in common use.

The New Union Station at Providence.

The project for a new union passenger station at Providence, R. I., which has been under consideration several years, but has been delayed by various causes, seems now to be well on the way to execution, and we print herewith a plan of the arrangements of the tracks and the main floor of the station, based on a sketch which we find in the Providence Journal. The details given below are also taken from that paper. We do not understand that this plan has been finally approved in all its details, but it is said that the essential features will be carried out as here shown. Since the New York, New Haven & Hartford acquired the Old Colony

the station and the support not only of most of the station, but of the tracks and train shed, on metal columns above the level of the street. All of the tracks are thus supported between the dotted lines indicated by *a a*. The main approach to the station from the street is by inclines on the south side, and the roadways leading from Francis street up to the approaches *T*, to *S* and *V*, rise at the rate of four per cent. or less.

Providence is a way station for trains between Boston and New York, and there are therefore four tracks for through trains. At the same time the number of trains beginning or ending their trips here is very large, and there are eight stub tracks extending eastward and eight westward.

Assuming that the topographical conditions referred to cannot be got rid of, they seem to have been met in a very successful manner. Subways are provided for passengers to cross the tracks in the most convenient way, and the approaches to these subways are made as easy as possible. Where steps are necessary they are made with broad treads and short risers, and, wherever possible, an inclined plane is introduced. The two large vestibules, *V V*, which form the main entrances to the principal waiting room, are below the level of that room, and the room itself is 2 ft. below the level of the tracks. The subways, which are between the lines indicated by *b* and *c*, are about 4 ft. higher than Francis street, and arriving passengers can descend from these to the street by four stairways (shown by dotted lines). It will be seen that the subways are 29 ft. wide. They will be well ventilated, finished in light colors and illuminated by electric lights. The descent to them by inclined plane is at the rate of only about seven per cent., or one foot in 16. The spaces marked *L* on the plan are to admit light to the street beneath. In a former plan these spaces were much larger, but by the present arrangement the platform space between the rooms and the tracks is about 75 x 400 ft.

The figures shown at various points, which do not indicate dimensions, give the elevations above the datum line (tide water).

The main corridor *A* has ample doorways. It is intended to have doors not only in the 24-ft. space between the ticket offices, but also along the whole length on either side of the ticket offices. The details of this feature seem not to be settled as yet.

The plans for the building have not been completed and the arrangement for the second floor has not been fully decided upon, but the location of the stairways leading to this upper story are shown, one between the vestibule and the restaurant and one between the vestibule and the baggage room. Francis street will have 14 ft. head room. The center of this street will be used by carriages, and street cars will have spaces 18½ ft. wide between the sidewalks and the curb lines. It will be seen that there is an abundance of spare room on the level of the street beneath the tracks. This may be used for carriage stands.

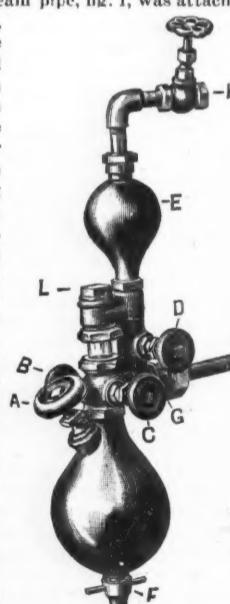


Fig. 2—Lackawanna Sight Feed Cylinder Lubricator.

"The Sky Route."

Reference has heretofore been made in the columns of the *Railroad Gazette* to the Barre (Vermont) Railroad, a short but busy road which gives a rail outlet to numerous granite quarries in and around the town of Barre, Vt., about 10 miles south of Montpelier. We print here-with a plan and profile of the track of this company which affords a good illustration of the adaptability of standard gauge railroad track to all possible needs.

This road was built in 1888 and 1889, the survey having been made by Crosby & Parker. The number of miles

P. T. & A. Chairman of Committee) was read and a synopsis follows:

Economy in trackwork was defined as that method of construction and management which, extended over a long period, will reduce to a minimum the yearly cost of maintaining track at a given standard of excellence. The report recommends that easy curves be used and that curves over two degrees have transition curves. Also that the roadbed should be wide enough to secure drainage in cuts and stable truck in fills, the cuts to have sufficient slope to prevent caving or sliding and the fills to be made in layers and never by dumping over the sides.

It is recommended that the depth of ballast under the

delight in these outside orders and will invariably waste their time if the order will protect them.

While this Committee does not propose to discuss the general subject of better pay, it is our opinion that a system of rewards either as premiums or as increase of pay to the older and better foremen could be employed to great advantage. All such rewards should be given on the principle that the greatest benefit shall go to him who secures the greatest results per dollar of expenditure.

The Committee is of the opinion that the use of standard tools of a good grade would result in economy and that almost every tool in use by trackmen is susceptible of great improvement in cost, weight, workmanship and utility, also that those in charge should know the actual cost of all tools, supplies and material, and keep a close check upon them. That all tools with parts liable to wear should be bought under a guaranty that all parts are interchangeable. The report is signed by I. O. Walker, E. P. Hawkins, G. W. Merrell, R. N. Gentry and Henry Hessmer.

The report was taken up in detail and freely discussed. It was thought by some members that the report should call for a minimum of 12 in. of ballast under the ties, instead of six, though the section was finally adopted as read.

W. H. Stearns (C. & N. W.) objected to the spacing of ties proposed, claiming that with ties of 9 in. or less in width the space allowed was insufficient to properly tamp, and advocating a spacing of 20 to 24 in. for all ties. Mr. Ross wanted at least 10 in. between ties and was supported by Mr. Doyle. W. W. Sharpe objected to the spacing proposed by Mr. Stearns and believed that there should be a minimum spacing adopted, and with very broad ties a distance of 20 to 24 in. between centers would leave too little room between ties. The sentence containing the Committee's recommendation was finally changed to read as follows: "The distance between ties, when of uniform width, should equal the width of tie, provided, however, that in no case shall the distance between ties be less than 10 in."

It was also decided to recommend four to nine braces per rail on outside and inside of sharp curves—braces to be placed on same tie, instead of four to six on the outside of curve as reported by the Committee.

The Association declined to adopt the paragraph of Committee's report which advises that joint ties be six to 12 in. longer than common track ties, and ordered it stricken from the section.

Mr. R. G. Ward called especial attention to the section concerning premiums, which he heartily supported, and cited the results of a system on his road by which foremen are paid according to merit or ability. This system recognizes three classes of foremen, the older and more experienced and careful men constituting the first class; men of ability and lacking somewhat in experience constitute the second class and are paid five per cent. less; while men of the third class are those of less ability or experience and are paid 10 per cent. less than men of the first class. Promotions are made as occasion offers according to merit. The result has proved the value of such a system. He also accompanies supplies sent to foremen with bills made out in regular order giving the cost of each article furnished, and the foremen are required to transcribe the bills in making out their regular reports. In this way they know the value of what they are getting; and though not held responsible for discrepancies, each one tries to keep down expenditures. With the amendments above noted the report was adopted.

At an evening session held the same day the first report presented was on Railroad Terminals. The report reviews quite carefully the various systems of freight terminals and makes some recommendations. It is signed by Messrs. Fry, Sattley and Lahey.

The Committee on Subdrainage presented a short report, in which attention is called to the frequent necessity of providing special means for the drainage of roadbeds. Reference is made to a letter from Mr. J. D. Hanks, at that time Chief Engineer of the Michigan Central, to the *Railroad Gazette*, in which he writes of some particularly badly heaved places into which he had dug and found, at a depth of from one to three inches beneath the ballast, alternate layers of soil and ice, the total thickness of the ice being the same as the elevation of the track caused by the heaving. Some of these places were in cuts and some in embankments, but in no case was the water nearer than 6 ft. below the peculiar formation.

Tile is recommended as being cheapest and best drain, as it gives a smooth and rapid flow with less saturation of the roadbed. The tile should be laid at such a depth as to be below frost. Water and frost are considered the great enemies of good track, and good drainage the foundation of all good surface tracks. The report was signed by Messrs. Jones, Sharpe, Mantz and Davis.

At the meeting of Wednesday morning the report of the Committee on Track Joints was read by Mr. R. G. Ward, South Carolina Railway. The Committee concludes that so far nothing has been brought forward that can replace the angle joint, and makes the following summary of the qualities of the joints that have been submitted for test:

The following joints have been submitted to your Committee for test and investigation during the past year: The Long truss, the Heath, the McConway & Torley, the Price, the Continuous, the Eno, the Niles.

The Long truss joint undoubtedly has merit; the channeled base plate should, however, be made long enough upon either side of the truss to fully cover the joint spaces; the angle bar should also be made sufficiently long to take in four bolts at least 5, 4 and 5 in. between centers respectively; and it is thought that the joint

References: b North Barre, c Barre Village, h Green Mountain Trotting Park, n Summit of main line, p Station for Graniteville

now in operation is 23, including the switchbacks and spurs. The track is laid with rails weighing 60 lbs. to the yard. The steepest grade on the main line is 264 ft. per mile, but on some of the short branches it is 470 ft. per mile. The highest elevation above Barre village, 1,025 ft., is near Graniteville, at the point marked p on the drawing. The road is operated by Baldwin saddle-tank locomotives weighing 50 tons on drivers. The engines have not only the Westinghouse quick action air-brake but also the Le Chatelier water brake.

This road now reaches 68 different quarries, nearly all of which have derricks loading directly on to the cars standing on the spur tracks. Some of the derricks lift 40 tons at a time. There were shipped last year 3,142 cars of granite averaging about 18 tons each. The road carries a few passengers, including some sight-seers, and the number carried last year was 22,106. The Managing Director of this road is Mr. W. A. Stowell and the General Superintendent Mr. W. A. Stanyan.

The Roadmasters' Convention.

We gave in last week's issue an account of the opening session of the eleventh annual convention of the Roadmasters' Association of America, held in Chicago on Sept. 12, 13 and 14. The afternoon session of Sept. 12 was occupied in the reading and discussion of the papers presented, a list of which was given in our issue of Aug. 18.

The first report submitted, on How to Take Care of Right of Way and Fences, was read by the Secretary.

The report recommended that the right of way should be cut in the month of July, and made specific recommendations as to general neatness and as to the uniform arrangement of all signs, mileposts, etc. The Committee made recommendations as to fences, giving sizes of lumber to be used in case of board fences, and recommended for barbed wire fence that it should be not less than 4 ft. 6 in. high, made of six wires with a top board. They also spoke favorably of the woven wire fence.

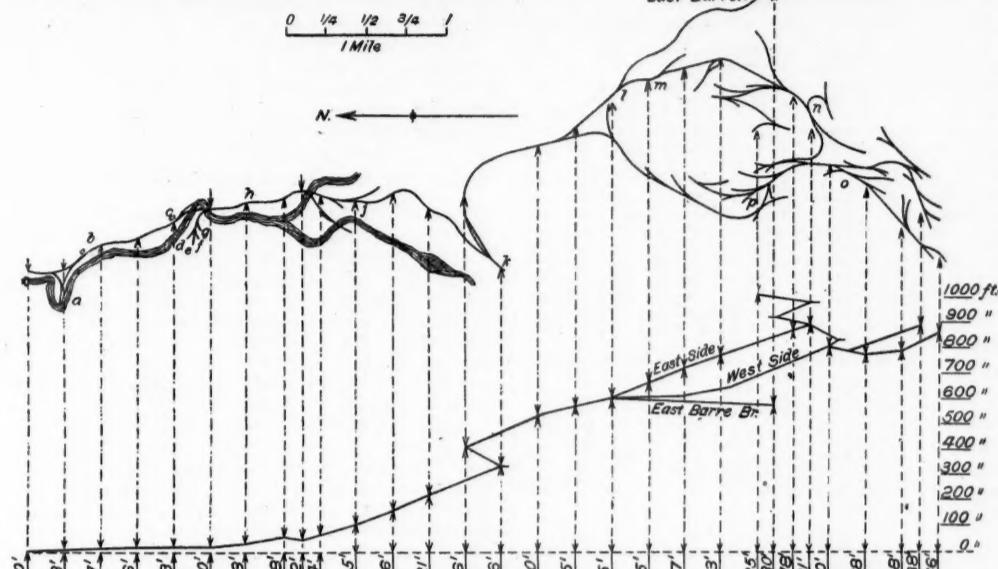
After some discussion the report was amended to make the time of cutting the right of way dependent upon the latitude, and the distinct recommendation of pine boards and cedar posts was stricken out. The section regarding woven wire fence was also amended to space the posts 8 ft. instead of 16 ft. With these amendments the report was adopted.

A report was presented on the Brotherhood of Section Foremen. This excited considerable discussion, and it was urged that the Association could not concur in a report condemning the Brotherhood without knowing more of its objects and action, nor adopt a favorable report for the same reason. Mr. R. G. Ward (S. C. Ry.) offered the following resolution, which was adopted:

Resolved, That the members of the Roadmasters' Association of America recognize the importance of doing all that can consistently be done to advance the interests of section foremen, but that the Association is not well enough informed as to the objects of the Brotherhood of Section Foremen to be able to advise foremen to join. That the Association is unalterably opposed to strikes.

A report on Track Appliances at the World's Fair, giving a careful enumeration of the exhibits, was presented and adopted.

A report on Economy in Trackwork (I. O. Walker,



Plan and Profile of the Barre Railroad, Barre, Vt.

ties should not be less than six inches and that the distance between ties should be about the width of a tie, so that the rail will be supported approximately over 50 per cent. of its length. The expense of putting a tie in the track is from 10 to 50 per cent. of its first cost, hence the economy in using those ties that will last the longest. Tie renewals cost nearly twice as much as rail renewals. The cause of tie renewals should be carefully studied. Ties taken from the track should never be burned or removed from the right of way without rigid inspection by some officer thoroughly familiar with the use of ties and the amount of work to be safely gotten out of them.

Better methods of fastening the rail to the tie should be used. The spike does not enable us to get the full life out of good ties under heavy traffic. Close economy requires that ties be worn out before removal. This Committee does not at this time recommend one form of tie plate or combined tie plate and rail brace, but deems it advisable that this Association appoint committees to obtain all available data and submit reports from time to time.

The use of four to six braces per rail on the outside of sharp curves will be found to reduce the cost of maintenance from 5 to 15 per cent.

Improved joint fastenings are in the market. The perfect joint fastening cannot be made as cheaply as the common angle bar, and will only be forthcoming when our companies are willing to pay for it. We should not depend on the joint appliances to hold it up, but should tamp the joint ties very hard, and these ties should be the best. It is possible that the joint ties should be from 6 in. to 12 in. longer than common track ties, and that the increased support thus secured would make up for the weakness in the joint fastenings.

Switches and frogs should be carefully built, carefully put in and closely watched. On a given system every detail connected with the switches should have a standard. Diagrams should be supplied to the trackmen showing all dimensions and parts so as to secure exact uniformity. While switch maintenance must be left in the hands of the sectionmen, it is more economical to have new switchwork and general overhauling done by one competent and expert gang on each division.

The general practice of working "so many men to the section" without due regard to the relative condition of the sections is not economy. The maximum benefit to be derived from a given yearly expenditure will be secured by placing the entire amount at the disposal of the maintenance department, say Jan. 1 of each year. The head of the department will then subdivide this amount among his divisions as their needs require, until finally the exact portion to be spent on each section is decided upon. Every officer and foreman then becomes a watchful financier. If the appropriation has been correctly subdivided the relative competency of those interested will be shown by the condition of their respective divisions or sections at the end of the year. The appropriation for betterments or construction should be separate from that for maintenance.

A reduction of force in the maintenance department is not necessarily economy. Yet this department is almost invariably the first to have its force reduced. When force must be reduced it should be done gradually so that all work under way can be safely closed up.

About once a year the track must be surfaced, lined and gauged. In this general surfacing the track should be raised just enough for secure tamping. This will average $\frac{1}{2}$ to $\frac{3}{4}$ in. on ordinary ballast and about 1 in. on mud and sand. The greatest care will be required to keep the sectionmen from raising the track too high. The best line and surface will be secured by having grade and center stakes set every three or four years. On sharp curves the center stakes should be tested once each year.

The work of the sectionmen should be reduced to a routine. Nothing outside of their regular work should be required of them without the authority of the roadmaster. The dispatcher, agents, bridgetmen and others should not give orders direct to the foremen except in cases of emergency. Besides interfering with discipline the time so spent is usually wasted. The foremen

thus made would be improved by shearing the angle bars from near the truss bolts out to the ends, so that the bar beyond the truss upon both ends would be reduced to the form of a plain strap. This would permit the spiking of the base plate firmly to the tie, and leave the movement to take place between the rail and the plate directly over the joint ties, instead of between the plate and the tie, as would otherwise be the case. The necessity for raising the rail to apply this joint is an objectionable feature, but it is thought that, if constructed with careful attention to improving details, it would justify a liberal trial.

The Heath rail joint, in the form submitted, is an unattractive device and is not likely to command itself unless somewhat altered and improved. If the angle forms were rolled so as to give the support usually obtained from the ordinary angle bar, and the base plate with depending fins retained substantially as it now is, it is thought that this joint would merit a fair trial. Formed as the vertical sections now are, it does not seem possible for the joint long to maintain an efficient support to the rail. It should be made longer and heavier, as well as of better form; at present it is difficult to apply and impossible to draw spikes from it with the ordinary claw bar. The consensus of opinion is that this joint has done better than its appearances seemed at first to justify, and, when intelligently designed and mechanically constructed, it is recommended for further trial.

The McConway & Torley joint can scarcely be considered as such, being rather an adjunct to a joint. It undoubtedly assists in developing the full strength of the angle bar, as well as in holding an even surface upon the rail at the joint. Where angle bars are used, especially upon light rail carrying heavy loads, it is believed that this would be found to be a valuable device.

The Price rail joint is made in a variety of forms, some of which are thought to be impracticable, and it is doubtful if any possess the necessary amount of metal to meet the requirements of joints under heavy traffic. It is but just, however, to say that the failure of the samples submitted properly to fit the rail has not made it possible to give this joint a fair trial. It is suggested that the manufacturer take up with some road the proper fitting of the joint to the rail section and the laying, under hard service, of at least one continuous mile.

The Continuous rail joint is simply an ordinary angle bar joint with the lateral plates rolled flat and bent squarely under the base of the rail. To the extent of the additional amount of metal, it is thought that this is an improvement upon the plain angle bar beyond which it is doubtful if there is any mechanical merit. It is claimed by many to be a good joint and is therefore recommended as worthy of trial.

The Eno joint, as submitted, is an unmechanically constructed and impracticable device.

The Niles joint, as submitted by model, is an ingenious contrivance, the advantages of which are not evident to your committee.

A number of other joints have come to the attention of your committee which have not been submitted for test, but which appear to possess sufficient merit to recommend them for a test trial, namely:

The M. W. Thomson joint (said to be in use on the Chicago & Northwestern Railroad).

The Richard P. Morgan joint (said to be in use on the Chicago, Burlington & Quincy Railroad).

The C. S. Churchill joint (said to be in use on the Norfolk & Western Railroad).

The F. A. Delano joint (said to be in use on the Chicago, Burlington & Quincy Railroad).

The Clark-Fisher "triple" joint (not known to be in use upon any road).

In conclusion your committee would call the attention of manufacturers of improved joints to the absolute necessity of carefully and intelligently designing and fitting their joints to the rail section for which they are intended. No device, howsoever meritorious, will ever succeed in which these conditions are overlooked. If the joint is to be improved, track men of all classes should take a more active interest in observing its requirements, and in endeavoring to overcome its deficiencies by alteration or suggestion; in which commendable work they should be shown a reasonable consideration by railroad authorities, who should make provision for at least a moderate amount of experimenting in improved appliances, to be conducted by their most active and intelligent men.

This report was signed by Messrs. R. G. Ward, J. M. Meade, John W. Wright, Jesse Supplee, R. P. Collins.

A motion to adopt the report as read met with prompt objection, and it was taken up by sections. Objection was raised to the statement that "nothing has so far been devised which will keep track in as good line" as the angle bar, and the words "generally used" substituted for "devised." Mr. John W. Wright mentioned the M. W. Thomson joint, the Blunt joint and the Long truss joint as being, in his opinion, as effectual as the plain angle bar joint for keeping track in line.

Mr. Wright, after some discussion, secured the adoption of the following as a substitute for the paragraph relating to the Long truss joint:

Resolved, That the Long truss joint has proved itself to be of undoubted merit after various practical tests in severe service extending over a number of years, and certainly justifies a liberal trial.

The section of the report relating to the Heath joint was next taken up and subjected to severe criticism. It was generally held that, unless something good could be said of a device, it was best to say nothing, but, in deference to the committee and with the explanation that the paragraph was intended as well meant advice, and not as a sweeping condemnation, the paragraph was allowed to stand.

At the meeting of Thursday a letter from Mr. Hammond, Secretary of the Superintendents' Association, was read asking the convention to choose delegates to meet with the Superintendents' Association in October. It was decided that the convention send three delegates of whom President Reed should be chairman, and that alternates should also be appointed.

The competitive essays on "How to Maintain the Best Track at Least Cost" were then read by the Secretary. Five essays were presented, and the prize of \$200 offered by *The Railway Age and Northwestern Railroader* was awarded as follows: First prize of \$125 to W. W. Sharpe (S. F. & W. Ry.), Waycross, Ga., and the

second of \$75 to T. W. Merrill (C. M. & St. P.), Savanna, Ill. Five papers in all were submitted.

At the afternoon session the report of the Committee on the Revision of the Constitution and By-Laws was taken up and adopted.

This was followed by the election of officers, which resulted as follows: *President*, H. W. Reed; *First Vice-President*, C. E. Jones; *Second Vice-President*, J. O. Walker; *Secretary and Treasurer*; W. W. Sharpe; *Executive Committee*, John Doyle, G. W. Merrill, W. H. Stearns and E. P. Hawkins. New York was selected as the next place of meeting.

The Future of the Steel Rail Trade.

A conspicuous steel manufacturer who has been interviewed lately on his return from Europe has drawn a very gloomy picture of the future of the steel rail trade. His principal argument seems to be that the amount required for renewals of old lines is annually becoming less and less, as those lines are now practically all laid with steel. He is credited with the statement that the steel rail trade must depend more and more upon new lines and extensions of old lines. We believe that this is an entirely erroneous view of the situation. As a matter of fact, the requirements for renewals have been the most important source of consumption for many years, and it promises to grow in that respect in the future. The replacement of iron by steel has not been a leading factor for years, the principal consumption being that due to the substitution of new steel rails for steel whose service in the track has been exhausted or for good steel rails too light to bear the heavier traffic imposed upon it.

A few figures will show that the position ascribed to Mr. Carnegie is untenable. Let it be assumed that the average requirement for a mile of new railroad, including its proportion of sidings, is, roughly, 100 gross tons. Deduct from the production of steel rails the quantity thus used. The balance represents the requirements for renewals. From the total production of rails we have first deducted the quantities which were made for street railroads. The following table covers the years 1889 to 1892:

Year.	Production of rails,	Used for new roads,	Renewal requirements.
	Gross tons.	Gross tons.	Gross tons.
1889.....	1,458,297	518,400	939,897
1890.....	1,796,778	534,900	1,251,878
1891.....	1,225,874	389,900	835,974
1892.....	1,440,264	416,700	993,564

Surely this does not look as though new mileage were the salvation of the rail producer. Nor has the disappearance of the old iron rail very much to do with renewals. "Poor's Manual" has for years shown how many miles of track in the United States are still laid with iron rails. According to these returns the number of miles by which the iron track has disappeared was as follows. We place alongside of these figures the approximate renewal requirements figured out in the above:

Year.	Reduction of iron track mileage.	Renewal requirements.
	Miles.	Gross tons.
1889.....	1,917	939,897
1890.....	9,817	1,251,878
1891.....	940	835,974
1892.....	836	993,564

Although iron rails were displaced by steel on nearly 8,000 miles of track more in 1890 than in 1889, the consumption for renewals jumped only 320,000 tons, and although it dropped back nearly 9,000 miles in the next year, the renewal requirements fell off only 420,000 tons. Let it be noted that although less than 1,000 miles of iron track disappeared in the two years 1891 and 1892, there were put into old roads over 830,000 tons of new steel rails in 1891 and very close upon 1,000,000 tons in 1892.

We believe that these figures prove pretty conclusively that the steel rail trade need not look with dismay upon the disappearance of the old iron rail as sure to rob it of much of its employment, nor need the makers depend upon the builder of new roads as their principal customer. The renewals of worn-out and light steel rails have been the main reliance in recent years and will be until the next railroad building era. The normal renewal consumption of the United States is between 800,000 and 1,000,000 tons, and is likely to grow slowly rather than to decrease.—*The Iron Age*.

Car Heating Systems at the World's Fair.

Of the many car heating systems at present in use in the United States only the systems of four companies find places in the Transportation Building. These are arranged along the north side of the partition near the exhibit of the Baltimore & Ohio Railroad.

The Consolidated Car Heating Co., of Albany, N. Y., has the most extensive exhibit in this line. In front of the space occupied, and placed on an elevated platform, is a train complete with locomotive and three cars all made about one-eighth full size. The equipment of each car is one of this company's standard systems of car heating: one representing the direct steam system; another the multiple hot water system, and the third the commingler hot water system. Each of these systems is also shown full size completely or partly connected up as when in service. The electric heating device for street cars and offices is also exhibited; an electric current is turned on to show how effective the system is for the purpose for which it is designed. Arranged on the walls are the various attachments for the four systems used by this company. On one of the wall spaces is a series of pictures illustrating the course of development of car heating devices from the old car stove to the present apparatus used by the Consolidated company.

The Gold Car Heating Company.—The display made by this company consists of its two heating systems: the duplex double coil system of hot water circulation in connection with the Baker or other hot water heater, and the storage system. The space occupied contains two platforms, each representing in full size the floor plan of a passenger car, on which the respective systems are

shown; the couplings between the platforms, the piping and other apparatus being the same as ordinarily used.

Safety Car Heating and Lighting Co. occupies a large space in Transportation Building, a part of which is given up to their exhibit of the Pintsch system of lighting cars. The hot-water system of car heating, as devised by this company, is shown, connected with a Baker heater. This is to show how the two are combined, so that, when for any reason steam cannot be obtained from the locomotive for heating purposes, fire may be used in the heater. There is also exhibited a steam heating system so arranged that the radiating surface may be increased or decreased as the temperature outside is lower or higher.

The Morton Car-Heating Co. has a display of its arrangement of piping for heating cars by steam. The exhibit consists of the floor plan of a car, with the standard arrangement of pipes and heaters along the sides of the car near the floor.

Railroad Day at Jackson Park.

The opening of the Manchester & Liverpool Railway, which took place Sept. 15, 1830, was celebrated on Saturday last at Jackson Park with appropriate exercises in Festival Hall. In the absence of Col. Geo. R. Davis, Director-General of the Exposition, the meeting was opened by Mr. Geo. H. Haafford, of the Chicago, Milwaukee & St. Paul, with an address of welcome and introducing Mr. Willard A. Smith, Chief of the Department of Transportation, who presided over the meeting and delivered a short address.

President M. E. Ingalls, of the Cleveland, Cincinnati, Chicago & St. Louis, then followed with an oration, in which was traced the remarkable growth of railroad interests, and showing the dependence upon them of the industrial and commercial world. He also dwelt at some length upon the labor problem as presented to railroad officers, and expressed the idea that the solution of the question lay in some form of profit sharing.

At the close of Mr. Ingalls' address greetings were sent by cable to the officers of the London & Northwestern Railway. Mr. R. Brocklebank, of the London & Northwestern, then spoke of the growth of his road from the old Liverpool & Manchester to its present position as the greatest railroad in England. Mr. Smith was presented on behalf of the Italian government with a bronze medal as a recognition of his services in bringing together the transportation display. Speeches were also made by Col. H. S. Haines, Vice-President of the Plant system, and others.

A feature of the day which aroused considerable interest was the tug of war between a Baltimore & Ohio switching engine and the electric locomotive exhibited by the General Electric Company. The result was a defeat for the electric locomotive.

Nine Passengers Killed at Manteno, Ill.

Nine passengers were killed and 20 or more injured by a rear collision on the Illinois Central near Manteno, Ill., on the night of Sept. 18, about 10 o'clock. The first section of southbound passenger train No. 45, of the Cleveland, Cincinnati, Chicago & St. Louis, was stopped on account of the stoppage of a preceding train at a water tank (not the usual water station), and was run into at the rear by the second section of the same train, crushing one sleeping car, one chair car and one day car. The accounts are contradictory, but it would appear that the second section was running within less than five minutes of the first one. One statement has it that the standing train could be seen from a long distance back; another is to the effect that there was a curve in the road, and that the flagman went back promptly.

The Iron Ore Syndicate.

For some time the newspapers have contained notices of a combination of heavy capitalists connected with the Standard Oil Company and various railroads to control the output of the new Mesabi mines. In fact "The Lake Superior Consolidated Iron Mines" is incorporated with a capital of \$30,000,000, Leonidas Merritt, President, with the city of New York for its headquarters. It has a majority interest in the Duluth, Mesabi & Northern Railroad, in the new dock at Duluth, and in the docks now built and building at Conneaut, O. It also controls 10 mining properties on the Mesabi, four or five of which are "steam shovel" mines, or mines in which the ore is so soft that it can be excavated by steam shovels after stripping off the surface and in some instances blasting the ore. It is also supposed to be reaching out for more mines. The American Iron Company's deposit in Cuba and the Rockefeller interest in the Colby syndicate mines on the Gogebic range are also included. The whaleback shipyard and plant is not included, but it is in closely allied ownership.

Such a combination threatens the profits of all small producers, directly and indirectly, by necessitating other combinations among ore producers to enable them to mine and ship with as nearly equal economy as is possible. Some of these small producers, apparently, have procured the publication of statements to the effect that this new corporation is to control the ore market by charging \$4.50 for its ore and extracting a profit of \$2.95 per ton, when standard Bessemer ore is

selling at \$3.75! Of this story the *Iron Trade Review* says:

"It is safe to assume that Mr. Leonidas Merritt, President of the Lake Superior Consolidated Iron Mines, did not say to a New York reporter the things credited to him in press dispatches of a few days ago. Certainly he did not say that the new iron ore syndicate would be able to mine so cheaply and save so much on transportation and other charges that it could make a profit of \$2.95 on every ton of Bessemer ore it shipped. And we can hardly believe that he ever said that it was the intention of the combination to keep the price of Bessemer ore at \$4.50 a ton."

The impression seems to be general among those engaged in the ore trade that the "Consolidated" will have to cut prices to market its necessarily very large output.

Railroad Matters in Chicago.

Passenger Traffic.—The feature of the past week's business of the Chicago roads was their enormous passenger traffic. Every road found its entire equipment in active use. Said the manager of one of the best known lines:

"It keeps us moving to handle the passengers over our lines, and I scarcely know what to do, as the prospects favor an increase." A representative of the Northwestern system said: "The road has no idle coaches or passenger locomotives. In order to accommodate the people along its line it has adopted days for certain points. For example, we ascertain how many wish to come from Oshkosh, or some other place, to the World's Fair on given days, and sufficient coaches are sent to bring them to Chicago. The coaches at once return to other points, and the succeeding day are back here full. Our regular trains are equally well filled, and are run in from two to five sections. Hence, despite the low fares, the enormous number carried bring us a round sum. The prospects for continued large travel the balance of the month are also good, and our September earnings will come well up to the same month last year." Vice-President and General Manager Robinson, of the Atchison, Topeka & Santa Fe system, said: "Our passenger business between the interior and Chicago is large and steadily increasing. The travel over the Southern Kansas, Oklahoma and Indian Territory lines is also heavy, and promises to continue so. The latter is also a more profitable business, because of better rates than received from World's Fair passengers." General Manager St. John, of the Chicago, Rock Island & Pacific system, said: "Our passenger earnings the first seven days in September were \$71,377 larger than the same days in 1892, and the second week will show a still heavier gain. In addition to our enormous Chicago business, on our system south of the Missouri it is as large as we can handle. The desire to get land in the Cherokee Strip seems to have set people wild, and our southern Kansas, Oklahoma and Texas lines have recently been taxed to their extreme capacity to accommodate the travel. The outlook for its continuing heavy is promising, and as rates to and from there are standard, the business pays much better in proportion to the amount handled than World's Fair visitors." The St. Paul officials stated that their passenger business was much heavier than in any preceding week in the history of the road. In addition to the World's Fair traffic, they were carrying a great many people north and west, and their local traffic had greatly improved. But their equipment is well employed. The Chicago & Alton has all its coaches in commission, and they are constantly filled. Like the St. Paul, its local business is very heavy, particularly so on its Chicago and St. Louis line. The manager of the Chicago & Eastern Illinois reports a good local and through business, a considerable portion of the latter being derived from Southern connections. At the general offices of the Louisville, New Albany & Chicago, it was stated that the entire passenger equipment was in service, and was scarcely able to handle the business. W. S. Merrill, General Manager of the Burlington system, said: "We are carrying a very large number of passengers, but our World's Fair traffic is erratic. Some days we have as many as our equipment can accommodate, and again it falls off materially, just as the people at different points wish to come to the Fair. It is the same way with the return business. The aggregate, however, exceeds any preceding time this year. We have also taken a good many excursions north and west within the past ten days, and this, in connection with our regular local and through business, gives very good employment to our coaches of all descriptions."

A good many close observers among railroad officers think that the present low rates have cut a very small figure in stimulating travel. They assert that the change in the business situation came just as farmers were through with harvest and merchants ready to buy stocks of goods for the autumn trade, and they all started at once. They also claim that more than ninety per cent. of the travel over the Western roads would have come to them had the rates that were made at the opening of the Fair been adhered to.

Freight Traffic.—The volume of freight moved was much greater than at any preceding time since the close

Spring, the gains in some directions being surprising, and in many descriptions of inward freight the past week's deliveries here from the interior were larger than for the corresponding week in 1892. The shrinkages in the few articles that failed to reach last year's volume were also small. The deliveries of grain for the week by 11 leading lines aggregated 6,623,000 bushels, compared with 6,454,000 bushels in the one immediately preceding, and 6,621,000 bushels the week ending Sept. 17, 1892. The gain over the previous week was a surprise to the majority of the road officers, as they looked for a decrease. The receipts of flour were also larger by 23,016 barrels, and the miscellaneous produce increased 11,640 tons. The coal tonnage was also larger, the bulk coming by the Chicago & Eastern Illinois and Atchison, Topeka & Santa Fe, the latter being a new factor in the coal supply of Chicago, due to the recent opening of its Illinois mines, which are claimed to be extensive. The Atchison deliveries for the week were 3,830 tons, an in-

crease over the previous week of 502 tons, and 914 over the week ending Sept. 2. The officers of the road state that the coal tonnage will continue to increase as the season advances.

The live stock traffic showed no appreciable change from a year ago. At that time, however, it was up to a full average volume.

The outward freight traffic, while not up to the unprecedentedly heavy business at this time last year, was materially larger than the preceding week, and the class of freight remunerative. A feature of the shipments was the large amount of merchandise that went out over all the Western roads, and especially to the Southwest. The officers also report that their business is materially improving at all points, and the number of idle freight cars steadily decreasing. The Southwestern Division of the Rock Island has recently done a large business with Oklahoma, and the Cherokee Strip "boomers" have been valuable patrons. The road sent many trains of "boom" freight there the past 10 days, and as the trains were not permitted to enter the Strip until Saturday afternoon, they were sidetracked at every available point near the line, with instructions to rush in as soon as they were allowed to do so. The freight carried is merchandise, provisions, tools, lumber and about every description of building material. The consignees are to direct the destination of the property after it enters "the Strip." The Atchison, Topeka & Santa Fe people also report an unusually heavy traffic in the same direction, and state that their earnings from their Southwestern business are largely increasing.

A new feature in the grain traffic of both the Atchison and Rock Island systems is the shipments of wheat from northern Texas and Oklahoma to Kansas City and Chicago. The latter country is said to have a fair surplus of wheat, and that its other crops, especially corn, will be much greater than wanted for home consumption. It will also have a liberal supply of cattle for market.

The following shows the amount of flour and grain delivered at Chicago by each of the railroads mentioned during the week ending Sept. 16 and same time in 1892:

By—	1893.		1892.	
	Flour.	Grain.	Flour.	Grain.
C. & N. W.	Bbls.	Bush.	Bbls.	Bush.
Ill. Cent.	11,281	754,000	11,013	947,000
C., R. I. & P.	3,453	1,011,000	273	799,000
C., B. & Q.	16,600	867,000	3,875	1,027,000
C. & A. Alton.	11,131	1,766,000	16,394	1,487,000
C. & E. Ill.	13,200	362,000	11,512	328,000
C. M. & St. P.	450	175,000	336,000
Wabash.	16,700	733,000	18,275	532,000
C. & G. W.	600	331,000	8,960	286,000
A. T. & S. Fe.	18,976	221,000	19,241	390,000
L. N. A. & C.	3,334	332,000	1,0	403,000
Totals.	96,629	6,628,00	89,715	6,621,00

CHICAGO, Sept. 18.

TECHNICAL.

Manufacturing and Business.

Clarence Whitman & Co., of New York, have been advised by their London agent that the British Admiralty after various tests have placed an order for a considerable quantity of Pantasote leather for use in the navy. Pantasote has been used for furnishing some of the new ships of the United States Navy, as recently noted, and has been ordered for others now building.

The Wickes Refrigerator & Car Co., of Chicago, filed a charter in Illinois last week, the capital stock being given as \$50,000. The incorporators are Walter H. Wickes, John L. Coudron and W. R. O'Mehundre.

G. D. Peters & Co., of London, which has probably the largest dealings in railroad supplies of any English firm, has opened an American office in the Metropolitan Building, New York City, in charge of Capt. J. L. Killmer as agent.

The Atwood Electric Headlight Co. of St. Louis, Mo., with a capital stock of \$125,000, has been incorporated by C. Atwood and D. McLaren, of St. Louis.

The Laidlaw-Dunn-Gordon Co., of Cincinnati, has contracted recently to furnish pumping machinery for the following cities: Princeton, Ind., one compound pumping engine, one and a half million gallons capacity; Linwood, O., two compound pumping engines, 750,000 gallons each, and three deep well pumps complete; Evansville, Ind., two compound pumping engines, three million gallons capacity each and Shreve, O., a deep well outfit capable of supplying the city with water.

H. J. Baker, the assignee of the Terre Haute Car & Mfg. Co., Terre Haute, Ind., has secured an order from the Circuit Court to rebuild a portion of the burned plant.

The Pratt & Whitney company, of Hartford, Conn., is employing 1,100 hands and running its shops full time.

The Pennsylvania Machine Co., of Philadelphia, shipped to Paris, France, recently three woodworking machines for use in the carshops of the Compagnie Générale de Construction at St. Denis.

Additional departments of the plant of the National Tube Works Co., McKeesport, Pa., have been put in operation, and the works may soon be operated to nearly full capacity.

The axle department of the Pittsburgh Steel Works, of Anderson, Dupuy & Co., at Chartiers, Pittsburgh,

have started up. All departments of this plant are now in operation on single turn.

The Granite Railway Signal Co., of Pittsburgh, with a capital stock of \$100,000, has been chartered by John S. Bennett, John N. Shephard and William H. Brown.

The Cleveland Rolling Mill Co. has started up about one-half of its plant, and it is stated that it will soon be giving steady employment to 3,000 men.

The Wagner car shops at East Buffalo, N. Y., which have been working only four days a week during the summer, have again resumed work with a full force.

The Safety Car Heating & Lighting Co. recently equipped 134 cars, built by the Harlan & Hollingsworth Co. for export to Brazil, with the Pintsch gas system. This company has also secured orders for the equipment of the cars of the Lake Street Elevated and the Metropolitan West Side railroads, of Chicago, with the Pintsch light.

The J. A. Fay & Egan Co., of Cincinnati, has received an order for one of its No. 6 band re-saws to go to Algoa Bay, Gold Coast, Africa. A No. 6 machine has a capacity of over 40,000 ft. a day.

The shops of the Carlisle Manufacturing Co., of Carlisle, Pa., were started up last Monday, several large orders having been received.

The Berlin Iron Bridge Co., of East Berlin, Conn., is to build a new station for the Lynn Gas & Electric Co., at Lynn, Mass. The dynamo room is 58 ft. x 157 ft., the whole space being controlled by a traveling crane. The boiler room will be 48 ft. wide, and the same length as the dynamo room. The roof of this building will be entirely of iron, constructed under the well known plate of the Berlin company.

The Ingersoll Sergeant Co. expects to occupy its new buildings at C'denewaldertown, near Easton, Pa., next month. Machinery is arriving from New York daily, and being put in place. The heating furnaces for the three steam hammers are now being built. The boilers for the plant are being made by Babcock & Wilcox, of New York, and the stacks, some eight or nine in number, by Tippett & Wood, of Phillipsburg. The boiler stack will be 90 ft. high. The buildings are all to be lighted by electricity.

An electric car operated by an underground conduit system, designed by Granville T. Woods, was lately tried on a track at Coney Island, N. Y. The distinctive feature of this device is the making of connection between the car and the source of electricity at intervals rather than continuously, the wire from the dynamo being brought to the points of contact with the car in hermetically sealed boxes. There is a long shoe attached to the car, so that at all times there shall be a connection with at least one of the boxes. In the experiment tried the conduit was filled with water and mud, so as to test the apparatus under unfavorable conditions. It is said that the results were very satisfactory.

Iron and Steel.

At a stockholders' meeting of the Thomas Iron Co., at Hokendauqua, Pa., last week, Samuel Thomas and James W. Fuller, of Catasauqua; Charles Stewart, William H. Hullick and F. A. Drake, of Easton, Pa.; W. P. Hardenbergh, of New York, and B. F. Fackenthal, Jr., of Riegelsville, were elected directors.

The Department of Railways and Canals of Canada has awarded the contract for 2,500 tons of rails for the Intercolonial Railroad to J. R. Hutchins, of Montreal, and a similar quantity for the same road to Charles Cassils, of Montreal. The contract for 1,000 tons for the Prince Edward Island Railroad and 300 tons for the Windsor Branch has been awarded to W. H. Daunt, of England.

Additional departments of the Homestead Steel Works, Homestead, Pa., have been started up, and with few exceptions the plant is running single turn in all departments.

New Stations and Shops.

The new union station at Sioux City, Ia., was opened last week. The building is a handsome one, and cost nearly \$250,000. The stone is red granite and sandstone. It is 120 x 318 ft., three stories high, the main entrance being on Third street. The trainshed covers nine tracks.

The Toledo Bridge Co., of Toledo, O., is erecting an addition to its plant, 90 x 250 ft., which will be equipped with machinery for structural ironwork.

The Chicago, Rock Island & Pacific is erecting a three-story stone passenger station at Fort Worth, Tex.

The contract has been let for building a 30-stall roundhouse for the Chicago, Burlington & Quincy at Luther, near St. Louis, Mo. It will cost about \$46,000.

The Pennsylvania has let the contract for work on the new Broad street station, at Philadelphia, above the eighth floor, to Mr. George W. Roydhouse. Bids will soon be invited for the inside work on this building.

Hall Signals on the Southern Pacific.

Hall electric signals have been placed at five drawbridges on the Atlantic system of the Southern Pacific. These bridges are located at Algiers, Harvey's Canal, Bayou La Fourche, Westlake and Orange. Each bridge has a home signal on each side 300 ft. distant, and a distance signal on each side 1,500 ft. from the bridge. There are bells announcing the approach of trains a mile away, and also bells which ring to notify the bridge tender when the signals have moved to the danger position.



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EDITORIAL ANNOUNCEMENTS

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad offices, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes &c., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

The condition of railroad traffic seems less unfavorable than it was a few weeks ago, and there is more confidence that business will soon take its usual or at least its natural course. It may not be amiss, therefore, to speculate as to the actual and permanent effects of the trade convulsion we have suffered, assuming that it come speedily to an end. So far as traffic is concerned, there are some things which in the course of a year will not be affected at all. Just as much grain, live stock and provisions, etc., will be carried as if the summer had been a prosperous one, though it may be carried a little later than otherwise. The measure of the damage to the carriers is the actual decrease in production, which for a time, in most manufactures, must have been very great. This in most cases cannot be made good. The time of the unemployed workmen is hopelessly lost. The people who gave up their pleasure excursions because of reduced income or the fear of it, will not make them in the fall or winter. Probably, however, no one counts on making good the recent losses in earnings, and their greatest hope is to get back to the ante-panic state of things. Assuming that all other obstacles to doing this are removed, the time within which this can occur would seem to depend chiefly upon the state of men's minds. They seem likely to take forward steps very cautiously, and we shall not venture to prophesy how long it will take them to convince themselves that they have solid ground under their feet.

The government crop report indicating the condition of all the chief crops Sept. 1 is by no means an encouraging document. Taking the crops altogether, we think so low an average condition has not been reported before since 1881. Wheat, corn, oats, cotton and tobacco, all are given a very low condition. Compared with last year, which was a fair year for wheat but a bad one for the other chief crops, everything is shown to be worse. The decrease in condition in corn is, however, about made up by the increase in acreage; but as last year's corn crop was 400 million bushels less than that of the year before, and with one exception the smallest for many years, this is not particularly encouraging. The wheat crops should, by the condition reported, be about 448 million bushels, against 516 millions last year; the oat crop slightly less; the cotton crop, about 34 per cent. less. The latter has time to change a good deal after Sept. 1, and the news is that it has been changing for the worse, especially in Texas. Unfortunately for the producers, the light yield of wheat is not reflected in the price. Although this has advanced recently, it is still lower, we believe, than in previous years of the heaviest crops, and this must

have a considerable effect in those sections of the country where wheat is the chief crop. Corn, however, and cotton command good prices. The condition of the various crops is not uniform in the different districts, of course, and doubtless some sections which have a good crop of their staple will profit by the higher prices due to a failure elsewhere. Wheat is an unusually good crop in Washington, where it is beyond all comparison the chief crop, and good in all the Pacific States. Corn is reported very good indeed in Iowa and Missouri, which are great corn states, and very bad in Illinois and Indiana and Ohio, which are also great corn states, and much lighter than last year in Kansas and Nebraska, the other two great corn states. The condition of cotton is worst in Texas, which produced nearly one-third of the crop last year, and in South Carolina, where much less of it is grown, though it is probably even more important to the state than in Texas, which raises much grain (for a Southern state), besides cattle and sheep in numbers unknown elsewhere south. The Gulf States east of Texas and Georgia, as also Arkansas, do not do so badly. Altogether, the indications are unfavorable, at a time when most business men seem to feel the need of encouragement. Traffic must be affected to a considerable extent unless the government estimates are unduly unfavorable.

Certain Senators and Representatives in Congress have suddenly realized that there is such a business as train robbing; although if they had read the *Railroad Gazette* as carefully as they ought to they would know that it is not new, and that 21 more or less successful attempts to rob trains had been made in the first half of this year (*Railroad Gazette*, July 7, 1893, page 505). But when a couple of sensational robberies called public attention to this industry some of those who have got into the habit of thinking that Congress can remedy all national and individual ills, even to the extent of abolishing poverty, promptly brought forward their panacea. Senator Peffer introduced a resolution commanding an investigation by the Senate, and Representative Caldwell, of Ohio, introduced a House bill defining the crime as murder if any one is killed, and giving the United States courts jurisdiction. If the Senator had looked up the statistics of this crime he might have learned that his own constituents are among the most active practitioners of this calling. Our investigations brought out the fact that 67 per cent. of all the attempted train robberies in the United States in the first half of 1893 were in Iowa, Texas, Kansas, Nebraska, the Indian Territory and Oklahoma; in other words that they were most numerous in those states "in which the people who make the laws and form public opinion have lately been most active in teaching that the railroads are the legitimate prey of 'the people.'" In fact it appeared to us "logical that a Populist statesman should take his gun and mount his horse and sally out to harass the gold bugs and vampires." In fact, there is probably enough law now to cover the matter; the trouble has come from an inefficient administration of the law, and this naturally follows from a depraved and vitiated public opinion.

There are some plausible and respectable arguments for putting this particular crime of train robbery under Federal jurisdiction. It appears to be a duty of the government to protect inter-state commerce by railroad if it undertakes to regulate it. If the states and counties do not protect railroad property and traffic, either because of weak or hostile public opinion, or because of poverty, or for any other reason, Federal protection seems to be necessary. But it is doubtful, at least, that Federal protection against train robbers would be any more efficient than local protection. If the Federal authorities assumed jurisdiction over this particular crime questions of jurisdiction and responsibility would at once arise. The state and county officers would in some cases hesitate to get into conflict with the Federal courts and officers, and in others would deliberately elect to let the United States government bear the expense of capture and prosecution. On the other hand, a United States officer some hundreds of miles away from the scene of the crime would be very likely not to get his machinery at work until the robbers were safe from pursuit. On the whole, the chances of getting any better protection from the Federal government than from the states seem too small to warrant an attempt to correct a particular evil by the extension of a bad principle. Let the railroad companies, the express companies, the states and the counties do their duty; and let the Senate quit fooling with the populists and mine owners and do its duty, which is to repeal this silver purchase act.

Compound Locomotives in Actual Service.

In another column a correspondent asks certain questions about compound locomotives, some of which will remain unanswered until eternity; but perhaps some light may be thrown on a few of the simpler points. In the first place he should distinguish carefully between defects in the compound system, of itself, and defects in proportions and dimensions of details. Possibly the whole reason why the compounds do not haul as many cars up the grade in question as the single expansion engines do is because the cylinders of the compounds are too small. Certainly it must be clear that the limit of hauling power of a locomotive should always be found in the weight on drivers, and the heaviest locomotive on drivers should haul the greatest load. When the drivers slip, then the limit of hauling-power is reached. But if an error has been made in the details of the design, such as the selection of too small cylinders, or an inferior valve gear, it may be that, at the speed of the freight train in question, there is not sufficient cylinder power to utilize the weight on the drivers. If this is so in this case, then here is one reason why the engine does not haul the load that might be expected of it. The steam pressure is surely ample, being 80 lbs. higher than for the single expansion engines.

Our correspondent does not say that the engines do not make steam enough, so that we may assume that there is no lack of boiler power. But if there was a lack of steam it would not necessarily follow that either the grate area or the boiler was too small; the whole lack of steam capacity might be the result of a bad location of the exhaust nozzle or deflector plate, or the use of too large a smokestack. Modern locomotives do not have such small boilers as to prevent making sufficient steam if they are forced properly. In nearly all cases, at the present time, lack of steam is caused by defects in minor details of exhaust apparatus in the smokebox. Probably the lack of hauling capacity in this particular case results from defects in the details that use the steam, viz., the cylinders. By taking some indicator cards when on the grade in question, defects, if any, can be readily determined. Our correspondent is right in assuming that the compound in this case should haul more cars than the single expansion consolidations.

The relative cost of the total of all train expenses and the cost of fuel when coal is \$1.10 per ton is about as four to one for 20-car trains, hence a saving of 30 per cent. in the fuel bills results in a saving of only 7½ per cent. in total train expenses. This saving is offset by a loss of revenue when the total trainload is reduced two cars out of twenty if there is an abundance of freight to be transported, and there is no final saving possible if fuel is but \$1.10 per ton, unless the compounds can haul more cars. But if coal is \$10 a ton, as it is in some sections, a saving of 30 per cent. by the compounds has quite a different bearing on the total final saving in train expense. At this price the relation of the total train expense to the fuel cost is about as eight to six for 20-car trains, and a saving of 30 per cent. in fuel gives a saving of 22 per cent. in total train expenses. This is great enough to warrant a reduction of several cars per train if need be, and that is exactly what is done in Mexico and other sections where coal is expensive. Even with single expansion engines it does not pay to haul a train equal to the full capacity of the locomotives when fuel is high. The loss of fuel due to forcing the engines more than offsets the saving in other train expenses in such cases. Perhaps the answer to our correspondent's question, then, is that where coal is only \$1.10 a ton it does not pay to use locomotives that will haul less cars even if they do give a saving of 30 per cent. in fuel per car-mile.

The fact that the compound passenger engine run through, from end to end of a 90-mile division, without taking water, while the single expansion engines have to take water between, is of itself some evidence of a saving in fuel by the compounds, unless it be that their tanks are larger. Why the single expansion engines are "quicker" than the compounds is a conundrum, as the question is put; but if the data were at hand perhaps the solution would not be difficult. Again, for these engines, as with the consolidations, assuming the steam supply to be sufficient, it is clear that the whole difficulty lies with the details. "Quickness," "smartness" and other qualities of locomotives, as known to engine runners, nearly always depend upon the details of the valves, links and cylinders, and the smartest engines can be made "loggy" by very slight changes. Probably in their case an examination of some accurate indicator cards at the average speed of the engines would reveal the true cause of the dullness of action. Quite likely the engines are working against themselves, and have so much

back pressure and compression that there is not enough power left to haul the trains as the single expansion engines can haul them. Compounds are more liable to defects in the valves and links than single expansion engines, but are not necessarily defective. It is not the fault of the compound system that the engines are "logy." Four cases are now on record so completely that it is beyond all question that the dullness of action of compounds is due solely to details of design. In each case very slight changes made a marked difference in action. In one case the removal of about two pounds of cast iron by chipping out the inside lap and leaving one-fourth inch inside clearance in the valves changed the engine from "dull" to "smart." In another case the cylinders were too small and they had to be changed. From this our correspondent can see that small defects of design, not of principle, may be the sole cause of the lack of hauling power of his compounds on grades at high speeds. An abundance of hauling power gives "smartness"; a lack of it brings "dullness."

As to running into a terminal with two or four cylinder compounds, as can be done with a single-expansion engine, in case of a breakdown, all depends upon where the break occurs. With a four cylinder compound of the Vauclain, Johnstone or Brooks tandem type the action is not different from that of a single expansion locomotive in case of a breakdown for the reason that the two sides of the engine are exact duplicates in action, and steam does not pass, from one side of the engine to the other during its transit from the boiler to the smokestack.

With two-cylinder compounds, as commonly made, steam cannot pass from the boiler directly to the low-pressure cylinder except in limited quantities through the starting valve and not in sufficient quantity to supply the low-pressure cylinder at any considerable speed; therefore if a break occurs that prevents steam from passing from the boiler through the high pressure steam chest to the exhaust passage of the high-pressure cylinder through the receiver to the low-pressure steam chest, the engine cannot be satisfactorily run with the low-pressure side.

But if the breakage is one of the common sort, viz., valve stem, piston-rod, connecting rod, crosshead, crank-pin, guide, cylinder head or any part that leaves the high-pressure and low-pressure steam chest and exhaust passages intact, then the engine can run in with a train with either the high-pressure or low-pressure side, as desired. In the case of such two-cylinder compounds as have a separate exhaust for the high-pressure cylinder, to be used at starting, the engine can be run in if the low-pressure steam chest or exhaust passage is broken, but cannot be run in satisfactorily if the high-pressure steam chest be broken. So much depends upon the exact dimensions of the starting valve that the hauling power of one side of a two-cylinder compound cannot be estimated until the possible steam supply to the low-pressure cylinder through the starting valve is known.

The Chicago, Milwaukee & St. Paul Railway illustrates in its recent history features not uncommon among railroads west of Chicago, but which people familiar only with old railroad systems in old countries frequently find it difficult to comprehend. This company has 5,724 miles of railroads, and has added very little to its system since 1887, previous to which it had extended it very rapidly. It was therefore in position to profit by the natural growth of a large new railroad system and the new country which most of it had been built to serve. The growth of traffic has been truly large—from 230 millions of passenger-miles in 1887 to 290 millions last year (to June 30, 1893), and from 1,629 million ton-miles to 2,378 millions; a gain of 30 per cent. in passengers and 46 per cent. in freight. And there has been also an increase in gross earnings which seems very favorable—27 per cent. in passengers and 38 per cent in freight—the amount of the total increase in gross earnings having been no less than \$8,600,000. As the capital account was very light, amounting to \$10,792 of stock and \$21,017 of bonds per mile, one might suppose that so great an increase in earnings, amounting to \$1,200 per mile, would permit a magnificent addition to dividends, it requiring only \$108 of profits per mile to pay 1 per cent. dividend, and here we have had an increase in gross earnings of eleven times that amount. But actually the dividend paid was 1 per cent. less on the common stock last year than in 1887. For this there are two causes, and these of a nature common to most railroads similarly situated—the expenses increase more in proportion than the gross earnings, and, in spite of the cessation of construction of new railroad, there is all the time necessary a large expenditure of capital for improvements, additions to equipment, etc. Thus in face of the increase of \$8,600,000 in gross earnings since 1887, net earnings have increased only \$1,448,000, so that about five-sixths of the vast growth of earnings has been absorbed by expenses. And as to capital, this company has outstanding \$10,518,000 more capital stock

and \$11,570,000 more bonds than in 1887. The increase in interest on bonds, it is true, has been comparatively small, because of the retirement of old issues at high rates of interest, while the new ones pay much less. It must be said, however, that after all this growth in the capital account of this company, it remains very light—\$12,543 of stock and \$22,852 of bonds per mile. Adding that part of the floating debt which is to be funded, this makes a capital account of only about \$36,000 per mile, and the interest charges last year were but \$1,234 per mile. It is still true that a comparatively slight addition to the profits will yield a substantial addition to the rate of dividend. One per cent. on all the stock is only \$125 per mile, and on the common stock, which will be entitled to all additional divisible profits until it receives seven per cent., or three per cent. more than it is getting, it is only \$80 per mile.

A recent article in a Philadelphia newspaper makes a number of statements in regard to the telegraph department of the Pennsylvania Railroad somewhat as follows: That a committee has been appointed to devise an improvement in telegraph methods, and that, as a result thereof, the railroad is putting in an entirely new telegraphic plant. In one part of the article it is stated that the poles are heavier, and in another part it is stated that poles are to be used; a combined copper and steel wire is adopted and a new insulator; the wires are to be strung nearer to the ground, etc. We understand that this article is correct, in so far that there is a committee of officers of this company investigating telegraphic standards, but this committee has not, as yet, devised any "system," so that, as a matter of course, no new standard has been adopted. A number of committees on telegraphs have been appointed by the Pennsylvania before, but we have never heard of any radical recommendations being adopted in consequence. It may be somewhat significant that the new organization of the Pennsylvania Railroad provides for a Superintendent of Telegraph, an office which has not yet been filled, although the Pennsylvania lines west of Pittsburgh have had a Superintendent of Telegraph for some time. Quite likely the filling of this office is postponed on account of the present business depression, but it hardly seems likely that the officers would adopt absolutely new standards for their telegraph department before appointing their Superintendent of Telegraph. A casual inspection of the main line of the Pennsylvania fails to show that any extensive changes of the telegraph plant have recently been made; so that it is probable that the article alluded to was written more to fill space than to convey information. Few railroad managers are in a position to improve their telegraph plant as they would like to. The property is generally more or less mixed up with that of a commercial telegraph company; and even where this is not an obstacle, progress is hard to accomplish on account of the position of secondary importance that the telegraph seems to hold—other departments get the appropriations first. There is one point that may constantly be borne in mind, however, and it is equally applicable whether the poles are owned by the railroad or by an outside company, and that is to make it a rule to set all new or renewed lines of poles as far from the track as possible. It is generally impracticable to move existing lines, but all lines come to decay sooner or later; and if this policy is steadily pursued the appearance of the road will, after a while, be greatly improved.

The business of insuring railroad companies against losses from train accidents seems not to make much progress, although those who have tried to establish such a business do not give up their efforts. The Long Island collision of Aug. 26 brought out some statements which illustrate the difficulties encountered in such a scheme. It is said that for a premium of \$75,000 a year the American Casualty Insurance & Security Company of Baltimore has heretofore guaranteed the Long Island Railroad Company protection against all claims for damages to persons injured on the road by accident. This contract was in force up to Aug. 5, but since the Parkville disaster the insurance company had increased the premium, and it is said that the railroad refused to pay the advance. This has been the story in previous experiments. One big accident seems to frighten the insurance company, while a long period of immunity seems to be a convincing argument with the railroad company that the premium paid is excessive. A "combined experience table," or its equivalent, is an essential in insurance, but that seems to be a thing impossible to get in this matter of accidents. It would be necessary to combine the experience of a good many roads for a long series of years to produce an average that it would be safe and fair to calculate on, and no such figures seem to be available. If the insurance is confined to the damage to cars, engines and roadway, or to these and merchandise in freight cars, the problem is much simplified, but even then the conditions of different roads are so variant that a permanently satisfactory basis for computing premiums is probably unattainable.

The belief that a policy of accident insurance, if known by railroad operating officers to exist, will weaken their sense of responsibility and thus lead to relaxation of their energies is not without some basis, and it has been referred to in vigorous terms in the daily press since the recent disaster. In fact we know of astute

railroad officers who hold this feature to be a fatal objection to such insurance schemes. Even the rich and conservative Boston & Albany had an insurance policy, on which it collected \$50,000 for personal injuries in the Chester disaster (it was a general policy, \$50,000 being the limit on any one accident), and as the published evidence shows that very loose methods prevailed in the engineering department, people will very naturally cite the Chester case as an illustration of the demoralizing effect of insurance. But the fact will very likely turn out to be otherwise, and the chances are great that the man or men responsible for the disaster took no thought of the insurance policy.

Why should a railroad company wish to insure against accidents? Its own attorneys, surgeons and claim agents ought to be so well acquainted with people and circumstances in their respective districts that they could settle claims more advantageously than any insurance adjuster—probably from a distant city—and if the insurance company cannot reduce the sums paid out, the only advantage in insuring is the distribution of the cost over a series of months or years. This a railroad of any length ought to be able to do for itself.

The *Financial Chronicle* publishes tables of gross earnings for August which are interesting. The industrial depression was very severe last month and would be clearly reflected in the freight earnings if we had them separately. As it is, of all roads which report changes in excess of \$30,000 during the month, but two, the Illinois Central and the Chicago & Grand Trunk, show gains; the others report decreases more or less heavy. Of these two obviously the gain is in passenger earnings to the World's Fair. One granger road reports that its increases in passenger receipts just about balanced its losses in freight. The Northern Pacific loses one-third of its gross receipts; the percentage on other roads, though not so large as this, is yet heavy. A list of roads showing losses of over \$100,000 in August is given below:

Northern Pacific	... \$916,027	Wabash	... \$171,000
Mo. Pac. & Iron Mt.	... 837,236	Chic. & Gt. Western	... 149,382
Atchison	... 765,885	C. Rock Is. & Pac.	... 133,125
St. Paul	... 496,709	East Tenn., Va. & Ga.	... 121,550
D. & R. G.	... 461,700	Mex. Nat'l	... 117,900
Louisville & N.	... 394,520	Chep. & Ohio	... 110,117
C. C. & St. L.	... 236,984	Cin., N. O. & Tex. P.	... 109,633
Mo., Kan. & Texas	... 193,625	Tol. St. L. & Kan. City	... 108,910

But perhaps a better view of the situation as a whole can be had by comparing the August reports for several years:

	Mileage.		Earnings.		Increase.
	Year given.	Year preceding.	Year given.	Year preceding.	
<i>August.</i>					
1889 (140 roads)	79,614	77,141	36,700,297	33,429,969	I. 3,279,328
1890 (154 roads)	88,560	86,021	10,631,120	9,032,895	I. 1,581,225
1891 (143 roads)	91,038	82,551	43,025,879	47,137,937	I. 2,892,94
1892 (132 roads)	90,979	89,407	45,702,553	42,006,704	I. 3,0,6,149
1893 (134 roads)	96,869	94,319	42,274,577	48,618,925	D. 6,343,348
<i>Jan. 1 to Aug. 31.</i>					
1889 (132 roads)	79,371	76,091	247,900,558	23,036,634	I. 17,873,204
1890 (144 roads)	85,311	52,873	286,946,033	259,257,109	I. 27,648,924
1891 (140 roads)	90,642	88,156	109,361,573	292,719,637	I. 16,13,386
1892 (130 roads)	89,621	88,049	321,260,970	300,694,779	I. 20,566,441
1893 (132 roads)	96,511	93,961	340,383,662	337,777,552	I. 2,606,130

Last August there was held in Zurich an "International Congress of Railroad Employees," at which delegates were present from England, France, Austria, Italy, Holland and Switzerland. It was decided to have an International Secretary, with office in Holland, with National Secretary in each country, communicating constantly with the International Secretary. The French delegates were commissioned to prepare a plan for an international organization, to be presented at a congress to be held in Paris next year, and a special committee is to prepare a plan for an international treasury. The Congress appealed to all trade organizations of all countries to aid in every possible way and especially through representatives of labor in the several parliaments, in establishing eight hours as the working day of all men engaged in transportation service, with an unbroken period of rest of 36 hours every week; at least 17 of these 52 days of rest to fall on Sunday, on which day freight traffic should be suspended. The Congress declined to discuss a resolution regarding minimum wages, and one by the Italian delegates that the railroads should be the property of the railroad employees; also one by the Dutch delegates, in favor of declaring a general railroad strike on the outbreak of war (which would probably be very unhealthy for the strikers in some countries). The Dutch delegates also proposed that in case of a railroad strike the international organization should support it morally and financially, no strike to be declared unless two-thirds of the national organizations consent. The Congress was held at the same time and place as the International Congress of Socialists.

Many of the numerous civil engineers both young and old, who are now out of employment and are writing letters to those of the profession who have employment, or at any rate have permanent offices, appear to forget that in order to insure replies to their communications they should inclose a postage stamp. The item of postage on replies to letters asking for positions is an important one in office expenses, and some engineers who

have offices of their own and are without a corporation back of them to pay for incidentals take no notice of such letters without a stamp inclosed for a reply, but simply put them in the waste basket.

Those railroads which consult their employees before deciding how much to reduce their wages are furnishing a good deal of business for the news agencies, whatever may be said about the success of such a plan from a business point of view. The shopmen of the Louisville & Nashville apparently have been out several weeks. It is stated that on Saturday last the company invited them to return to work and that the invitation was declined, a meeting of 900 men at Louisville resolving to resist the reduction "to the bitter end." Notices have been posted that, beginning with Monday, the shops will run 10 hours a day until Oct. 14, and then from Oct. 16 to the end of the month nine hours a day. It was thought that a large majority of the men will have signified their intention of returning to work before Monday. The boilermakers working for the Cleveland, Cincinnati, Chicago & St. Louis at various points have struck, and there is a good deal in the dispatches about the threats of other men on this road, but we do not gather that anything very serious has yet taken place. Many conferences have been held, and President Ingalls is said to have proposed a "profit-sharing" plan. This will no doubt be received by the men at this time with unbound enthusiasm. It has been reported that the employees of the Union Pacific are likely to create a deal of trouble on account of the reduction in pay on that road, but the officers seem not to be disturbed. The agreements between the Denver & Rio Grande and its employees terminate at different dates. That with the engineers and firemen expired on Sept. 20. It would appear that a good deal of talk in the newspapers and elsewhere has been started with a view to seeing what effect it would have on the management of this road. A Denver paper says that the Atchison, Topeka & Santa Fe has not yet reduced wages in that region, but that the pay days have been postponed so that they are now about a month behind. Philadelphia and Pittsburgh papers report that the Pennsylvania is still making reductions in the auditing and other clerical departments. The Brooklyn Elevated road has made a reduction of 10 per cent. in the wages of all employees receiving over \$1.60 a day. Loss of business, due to the new electric surface lines, is given as the cause.

NEW PUBLICATIONS.

The Transition Curve by Offsets and by Deflection Angles. By Prof. C. L. Crandall, M. Am. Soc. C. E., Cornell University. New York: John Wiley & Sons. Price \$1.50.

This is a small volume of 64 pages, in pocketbook form. The curve treated is the true transition curve whose curvature increases directly with the distance. Accurate methods have been developed which will hold for large central angles for both offset and deflection methods. The treatment heretofore given to the subject has usually been by approximations which were accurate enough for the work usually met in the field, but did not hold for large central angles. There are 25 pages of tables for fieldwork, so that the field computations have been reduced to a minimum. The book is characteristic of Professor Crandall's work; accurate, concise and to the point. It will help to settle the question of transition curves and will give some of our mathematical correspondents time to look up another subject for analytic investigation.

Journal of the New England Water Works Association; R. C. P. Coggeshall, Secretary, New Bedford, Mass.—The September issue of this journal contains the proceedings, papers and discussions brought out at the 12th annual convention held at Worcester last June. Those who are familiar with the character and work of this Association will understand that the papers and discussion are valuable. The longest paper is on the Works of the East Jersey Water Co., by Clement Herschel, which is a very thorough monograph admirably illustrated with many folding plates.

The Engineering Society, Annual. Published by the Engineering Society of the University of Georgia.—We are in receipt of the first issue of this publication. It contains a number of papers which, although short, indicate intelligent study and interest in practical affairs. The articles of more special local interest in the region of the university are Georgia Marble, Levees, the Forestry Question, Road Improvements, and the Engineering Department.

TRADE CATALOGUES.

Couplers, Vestibules, Continuous Platforms and Forgings of the Gould Coupler Company, Buffalo, N.Y.—This catalogue is a good illustration of the beautiful books published for the trade in these days. It is good in paper, ink and press work, and its dimensions are 9 x 12 in., the size suggested by the M. C. B. committee. It is in black and white too, which is in better taste than the late practice of using blue, brown and red inks on tinted papers. The frontispiece contains a full page engraving of a bird's-eye view of the company's malleable iron works, and this is followed by two half-page illustrations of its steam forge plant. Seven pages are given to illustrating the Gould couplers and their parts, and

equal number of pages of text are devoted to the terminology and descriptions of the same. The Gould pendulum vestibule is described and its parts illustrated, together with the company's buffer and continuous platform. Some space is given to the forgings manufactured by the company, and the book concludes by giving the names of railroads using its couplers, continuous platform and vestibules.

TECHNICAL.

A Steam Street Railroad.

The Galt & Preston Street Railway Co. has been formed to build a line between the two towns named, and it is stated that the Directors have decided to use steam motors.

Large Plate Girders.

At the bridge works of Cofrode & Saylor, at Pottstown, Pa., three heavy girders are being manufactured for a Pennsylvania Railroad bridge at Columbus, O. One is 96 ft. in length, 9 ft. 7 1/2 in. high, and weighs 67,000 lbs.; the other two measure 107 ft. and 116 ft. 6 in. in length respectively.

The Canadian "Soo" Canal.

The Dominion Government is calling for bids to be received up to Sept. 28 for the construction and setting in place of five pairs of lock gates at the Sault Ste. Marie Canal. Plans and specifications of the work to be done can be seen at the office of the Chief Engineer of Railways and Canals, Ottawa. New bids are called for because the lowest bidder, the Hamilton Bridge Company, refused to accept the contract. It was reported that the work would be given to the next lowest, Messrs. Ryan & Haney, but it appears the department has decided that it would be best to advertise for tenders anew. The work is estimated to cost about \$80,000.

Electric Light and Power for the New Station at Boston.

The Boston & Maine Railroad has let to Messrs. Westinghouse, Church, Kerr & Co. the contract for an extensive power and electrical equipment for the new terminal passenger station in Boston. The plant represents an aggregate capacity of 1,100 H. P. in the engine-room, with corresponding equipment throughout. There are four Westinghouse generators coupled direct to Westinghouse compound condensing engines of 200 H. P. each. Two of these generators will supply 4,000 incandescent lights for the interior of the headhouse; the other two furnish power to the various motors operating drawbridges, turntables, elevators, coal handling machinery, etc. Besides these, there are two more compound engines, respectively of 200 and 100 H. P. each, driving alternate current machines for the lighting at Prison Point and East Somerville, one and two miles out, and for the track lighting and the signal towers. Each of these engines exhausts into an independent Bulkley condenser using salt water. A battery of 12 horizontal return tubular boilers supplies steam at 125 lbs. pressure.

The smokestack is of steel, rising only 55 ft. above the ground level, and draft is furnished by two large Sturtevant fans, each driven by a small independent engine, and each capable of performing the whole service when required. The hot flue gases are drawn through Greene economizers, and the heat saved is returned to the feedwater. The use of a fan places the control of the draft in the hands of the engineer, to be manipulated at pleasure, and in this case greatly reduces the first cost, as a tall chimney would have to be built upon a piling foundation. The Engineer in charge for the contractors is Mr. George H. Barrus.

THE SCRAP HEAP.

Notes.

A St. Paul dispatch states that there is now a surplus of help in the harvest fields of Minnesota and Dakota, and that wages have dropped to \$1.75 a day and lower.

The "Steam Railroad Men's Union" has organized a "state board" in Pennsylvania; the object, as stated by the promoters, being to secure legislation favorable to railroad employees.

Among the artisans sent by the French Government to see the World's Fair and to visit prominent cities in America are two or three railroad yardmasters, as well as several representatives of the mechanical departments of railroads.

Tony Polecastro, an Italian, has been sentenced to 10 years' imprisonment at Jersey City for trying to place a large rock on the track of the Pennsylvania Railroad in front of an approaching passenger train. Daniel Lorah has been imprisoned for four years at Reading, Pa., for trying to derail a car on the Neversink Mountain Electric Railroad.

Senator Frye, of Maine, has introduced in Congress a bill providing for the settlement of the debts which the Union and Central Pacific railroads owe to the Government. In general, the bill is the same as those presented in previous Congresses except that the whole debt of both roads is extended 100 years, and the rate of interest is to be 2 per cent. after the first 10 years. For these 10 years the rate is to be 1 per cent. The two companies fare alike.

South American Notes.

The Peruvian Government has determined to extend its telegraphic service northward from Piura to connect with the telegraphic system of Ecuador.

A joint commission of representatives of Brazil and France will shortly proceed to the Tumac-Humac range

to fix the boundary line between Brazil and French Guiana.

An important concession has been authorized by the state of Minas Geraes, Brazil, for a railroad from Santa Barbara, in that state, passing through the towns of Ponte Nova and Manhuassú, and connecting with the railroad to Allegre, in the sea coast state of Espírito Santo.

Lake Notes.

A free movement of grain was inaugurated at Chicago on the 13th, when charters were made for over one million bushels. The standard price seems to have been, corn to Buffalo, 1 1/2 to 1 1/4 cents.

The new steel steamer "Centurion," which has recently been completed at the yards of F. W. Wheeler, the Bay City shipbuilder, was chartered lately for a load of 155,000 bushels of corn from Chicago to Buffalo. This exceeds all grain cargoes carried on the lakes by 13,000 bushels. The "Selwyn Eddy" had established a record by loading 141,600 bushels of corn, which eclipsed that held so long by the "E. C. Pope."

A few days ago the "Colgate" came down from Duluth to Lake Erie ports with three barges in tow. The total burden was 185,000 bushels of wheat and 7,795 tons of iron ore. Three barges loaded with iron ore were dropped at as many different ports, while one barge loaded with wheat and the steamer discharged in Buffalo. This is in realization of Captain McDougal's plan to start a tow of loaded barges for lower lake ports and distribute them as a local freight train would distribute cars, some steamer of the line, returning to Lake Superior, picking up the barges.

A week ago there was a race from Chicago to Milwaukee between the whaleback steamer "Christopher Columbus," which generally carries passengers between Van Buren street and the World's Fair pier, and the Goodrich line steamer "Virginia," which was thought to be the fastest steamer on the lakes. It is reported that the "Christopher Columbus" beat the "Virginia" by four miles in a distance of 80, or was the faster boat by 5 per cent.

Track Elevation in Chicago.

A preliminary report on the elevation of tracks in the city of Chicago has been made to the City Council by Consulting Engineer G. Howard Ellers. Mr. Ellers reports that he has made a thorough personal examination of the entire systems within the present city limits, including the lines of the Pittsburgh, Fort Wayne & Chicago, the Chicago & Western Indiana, the Belt Line, the Chicago, Rock Island & Pacific, the Lake Shore & Michigan Southern, the Chicago & Northwestern, the Chicago, Burlington & Quincy, the St. Charles Air Line, and all the switching and other tracks included between State and Canal streets and Lake and Twenty-second streets, and is positive that the very dangerous crossing at Archer and Stewart avenues can be successfully removed, and that, too, without the erection of a viaduct. A description of this dangerous crossing was given in the *Railroad Gazette* of Aug. 11, 1893.

Mr. Ellers is at present engaged on plans for the joint elevation of the Pittsburgh, Fort Wayne & Chicago and the Chicago & Western Indiana roads from a point north of Archer avenue, south to the vicinity of Forty-sixth street, where the tracks of the two companies diverge, and thence on each line separately to near Seventeenth street. This would indicate that the plans submitted by the Fort Wayne road several weeks ago, note of which was made in our issue of Aug. 18, are not entirely satisfactory to the city officers. An examination of the tracks of the other roads that enter the city is progressing as rapidly as possible.

Snow Sheds in the Cascades.

The Great Northern has let the contract for building the necessary snow sheds in the Cascade Mountains to Mathews & Krech, of St. Paul, Minn. It has not yet been decided how extensive this work will be, but the sheds specified in the present contract are to be completed by Nov. 15. The company received 12 tenders for this work.

Grain Shippers' Side Tracks in Minnesota.

The Supreme Court of Minnesota holds that a railroad company must build a side track to an elevator or warehouse erected adjacent to the railroad right of way. This case, which was first brought before the Railroad Commissioners in 1889, is that of the Farwell Farmers' Warehouse Association vs. the Minneapolis, St. Paul & Sault Ste. Marie Railway Co. The Commissioners, after full hearing, made an order requiring the railroad company to build the side track to the elevator, which had been built outside its right of way. The railroad company resisted, and a suit was then begun in the District Court to compel the observance of the order of the Commission. The court decided in favor of the complainants, and the defendant company appealed the case to the Supreme Court of the state. The decision of the higher court sustains the lower, holding that "the railroads must be so operated as to reasonably accommodate the business, and subserve the interests of the public."

While the decision is, as far as this case is concerned, in all probability a just one, it will open the door for impositions on the part of the farmers and shippers. For years they have been clamoring for a "free and open" market. In some instances they have secured permission from the railroad companies and built elevators on the right of way for the alleged purpose of providing against attempted monopolies, but as soon as another elevator company, already engaged in business at that point, made them a reasonable offer their clamoring ceased and they pocketed the proceeds without a care as to whether the market remained "free and open" or not. Aside from this there will be increased danger in the operation of railroads occasioned by the additional switches in the main line.

Train Robberies in Michigan and Elsewhere.

A passenger train of the Mineral Range Railroad was stopped near Boston, Mich., by robbers at 9 o'clock on the morning of Sept. 15, and the express car was robbed of \$70,000. The robbers opened the express car with a sledge hammer. Fifteen men have been arrested for participation or complicity in this robbery, and it is said that most of the money has been recovered. It appears that one of the robbers, although masked, was suspected by the engineer to be a former fireman on the road and this suspicion seems to have proved correct. Railroad officers and detectives ferreted him out and he was arrested and made a confession. The express messenger is one of the men arrested, being charged with having given information to the robbers.

The number of men implicated in the robbery on the Lake Shore is believed by some to have been five or less. No arrests have been made as yet which afford any hope that the actual robbers have been found, although de-

tectives have thoroughly scoured Indiana and the surrounding country, and several alleged clews have engaged the attention of citizens.

Three freight trains were boarded between Fargo and Casselton, N. D., on Sunday night, by five masked men, and 15 harvest hands who were found on the trains were robbed of their earnings. One of the harvest hands was killed.

A freight train was "held up" on the Central of Georgia, and in the ensuing chase of the highwaymen an innocent person was killed.

LOCOMOTIVE BUILDING.

The Brooks Locomotive Works, Dunkirk, N. Y., shipped two locomotives to the Illinois Central last week.

The Dominion Government has just purchased two large mogul engines for the Intercolonial road from the Cooke Locomotive Works, Paterson, N. J. Canadians look upon this as "a direct slap" at the Canadian works engaged in the manufacture of locomotives.

The New Orleans & Northeastern has lately put in service the first of six passenger locomotives built by the Baldwin works. One or more of these engines are compounds, and we learn from a local report that "the part of the machinery by which the waste steam is utilized consists of four cylinders, two of which are smaller than the others. They are so arranged that they prove recipients of the escaping steam, and enable it to again be passed into the boiler."

CAR BUILDING.

Orders have been received at the Altoona shops of the Pennsylvania for 100 box cars and 500 coal cars.

The Ratburn Car Company, Trenton, Ont., has built four passenger excursion cars for the Ottawa & Gatineau Valley.

BRIDGE BUILDING.

Addison, N. Y.—The E. A. Perkins Iron & Steel Bridge Co., of Horseshoe, N. Y., has secured the contract to erect an iron bridge over the Tuscarora Creek at Jasper. Work will soon begin.

Aitkin, Minn.—The county commissioners of Aitkin County have decided to ask for plans and tenders for a steel drawbridge across the Mississippi River at Aitkin, and have instructed the county surveyor to advertise for them.

Beaver, Pa.—J. R. Dolby has been awarded the contract to build a bridge across Brush Run, in South Beaver Township. The contract for the stone work of the bridge over Tramp Mill Run, in Hopewell Township, has been let to Marsh Horton.

Beaver Falls, Pa.—The Pittsburgh & Lake Erie is erecting a bridge over the run at this place.

Chicago, St. Paul, Minneapolis & Omaha.—This company will erect the following iron bridges on the Northern Division: Totogotic River, 126-ft. through span; Amisicon River, 120-ft. deck truss and one 40-ft. and one 50-ft. span; Fish Creek, near Ashland Junction, 126-ft. through span; Namakagan River, 100-ft. through deck span; Bear Creek, 114 ft. through span. The same company will build a two span bridge across the Big Sioux River at Sioux Falls, S. D. It will be in two spans, 148 ft. 6 in. and 147 ft. 6 in. The masonry for piers and abutments will be done by the company, and the superstructure of all the bridges will be erected by the Lassig Bridge & Iron Co., of Chicago.

Columbus, O.—Bids for the Big Darby Bridge superstructure were as follows: Youngstown Bridge Co., \$14,000; Massillon Bridge Co., \$13,000; Columbus Bridge Co., \$12,000, \$12,600 and \$11,900; Detroit Bridge Co., \$14,700; Groton Bridge Co., \$9,000; King Bridge Co., \$13,013; Jackson Bridge Co. (Mich.), \$10,428, \$9,628 and \$8,168; Pittsburgh Bridge Co., \$8,900; Penn Bridge Co., \$13,000; Wrought Iron Co., \$13,658 and \$12,967. Cost of bridge limited to \$25,000. As the bids are all above the engineer's estimate, new proposals will have to be asked. Bids for the East Broad street bridge, to cost not more than \$50,000, have been received as follows: Dubuque Construction Co., Dubuque, Ia., \$49,885 and \$73,885; Youngstown Bridge Co., \$22,600; Brackett Bridge Co., \$28,500; Detroit Bridge Co., \$16,500; Groton Bridge Co., \$17,000; Penn Bridge Co., \$23,350; Pittsburgh Bridge Co., \$23,800; King Bridge Co., \$26,578; Toledo Bridge Co., \$25,475; Jackson Bridge Co. (Michigan), \$26,735 and \$20,867; Massillon Bridge Co., \$23,700; Milwaukee Bridge Co., \$24,615; Columbus Bridge Co., \$24,900 and \$24,600; Wrought Iron Bridge Co., \$26,000, \$25,680, \$29,995 and \$31,454. Only one or two bids here are below the engineer's estimate, but the contract will probably be awarded in a few days. Bids for the Westerville bridge superstructure were: Milwaukee Bridge Co., \$11,950; Pittsburgh Bridge Co., \$11,100; Penn Bridge Co., \$11,145; King Bridge Co., \$11,08; Massillon Bridge Co., \$11,050; Columbus Bridge Co., \$10,395, \$10,300 and \$10,898; Youngstown Bridge Co., \$11,600; F. J. P. Brackett Bridge Co., \$12,200; Groton Bridge Co., \$11,900; Detroit Bridge Co., \$11,500; Jackson Bridge Co., \$9,285, \$7,425, \$6,955 and \$5,908; Wrought Iron Bridge Co., \$11,215, \$10,998, \$11,397 and \$11,479. All bids are above the estimate, and new proposals will have to be asked for this work. The bridge is limited to \$25,000.

Dorchester, N. B.—Flemming & Son, of St. John have just finished an iron bridge which is to be put across Palmer's Pond, near Dorchester. The structure is 84 ft. long.

Easton, Pa.—The Commissioners have decided to invite proposals for the widening of the Third Street Bushkill bridge to the width of that street. The cost has been estimated at from \$18,000 to \$20,000.

Halifax, N. S.—It looks as though the Dartmouth Bridge, between this city and Dartmouth, is to be rebuilt in spite of the protests to the Government. Last week engineers sent by the Dominion Government were making soundings with the object of finding the best spots on which to erect foundations for a bridge. F. M. Hamilton, Acting Chief Engineer of the Public Works Department of Canada, will soon arrive, when something definite will be learned regarding the action of the government. It is stated the bridge will be of iron on stone piers.

Harrisburg, Pa.—Bids have been opened by the County Commissioners for the construction of the abutments of the new iron bridge to span the Lebanon Valley tracks at Boyd's Station, and the contract for both the stone work and superstructure will shortly be let.

Jersey City, N. J.—The New York *Herald* reports that a bridge is to be built across the water which separates Jersey City from the strip of land on which the terminal station of the Central Railroad of New Jersey is located.

Johnstown, Pa.—It is proposed to issue \$150,000 worth of bonds, in order to open a number of streets and build the necessary bridges.

New Glasgow, N. S.—John Stewart & Co. have the contract for the construction of four bridges in this province; one at Lockport, Shelburne County, two spans 85 ft. 9 in. each, and a pivot span of 116 ft. This bridge is to be made strong enough to carry the engines and cars of the proposed narrow gauge railroad. Another bridge is Phinney's bridge, in Digby County, 81 ft., one span, 16 ft. roadway; another, Meissner's bridge, in Lunenburg County, 80 ft., one span, 15 ft. roadway; another, Ball's bridge, near Sydney, C. B., 80 ft., one span, and 15 ft. roadway. These bridges are all to be built of iron.

Omaha, Neb.—The draw span of the bridge being built across the Missouri River by the Omaha Bridge & Terminal Co. was swung on Sept. 14. The draw span is 520 ft. long, and the fixed span is 500 ft. long. J. A. L. Waddell, of Kansas City, is the Chief Engineer.

Ottawa, Ont.—Mr. H. J. Beemer, President of the now amalgamated railroads, the Ottawa & Gatineau Valley and Pontiac & Pacific Junction, has ordered his engineering staff to prepare plans for the bridging of the Ottawa River at Ottawa, and also near Pembroke, Ont., and the Chief Engineer, Dale Harris, is now making the surveys.

Philipsburg, N. J.—The Board of Freeholders of Warren County have awarded to Tippett & Wood, of this place, the contract to build a wrought iron bridge, 50 ft. 6 in. long, over the Musconetcong Creek, at Springfield. There were 10 bids, ranging from \$675 to \$1,410.

Philadelphia & Erie.—Two large iron bridges are being constructed at Waterford, and near Union City. They take the place of old wooden structures. The work is under the direct supervision of C. A. Preston, Principal Assistant Engineer, assisted by Jesse Supplee, as Division Engineer.

Reading, Pa.—There were four bidders for the construction of the iron superstructure of the new bridge across the Schuylkill River, near Exeter Station. Cofrode & Saylor secured the contract at their bid of \$12,000. Joseph P. O'Reilly received the contract for the masonry, his bid being \$10,914. This will make the total cost of the structure \$22,914. It is to be finished by Dec. 25.

The new Schuylkill avenue bridge was finished Sept. 19.

Scranton, Pa.—The Common Council has passed a resolution providing for the appointment of a joint committee to act in conjunction with the Mayor and City Engineer in preparing plans and estimates for a viaduct over the Delaware, Lackawanna & Western on West Lackawanna avenue.

Shelby, O.—Bids for the superstructure work of the Borchers bridge, in McLean township, were as follows: F. J. P. Brackett Bridge Co., \$4,300, \$2,300 and \$3,600; Canton Bridge Co., \$4,816; Massillon Bridge Co., \$4,550 and \$5,300; Ohio Bridge Co., \$5,050 and \$6,000; Buchanan Bridge Co., \$5,500 and \$4,500. There were other bidders, but they failed to bid on two plans. The contract has not been let.

St. Cloud, Minn.—All the bids received for the rebuilding of the St. Germain street bridge have been rejected. The proposition to build an entirely new structure has been revived, and will probably prevail.

Sunbury, Pa.—The last span of the iron railroad bridge, between Packer's Island and Northumberland, was put in place Sept. 10, and completes the work for this season, although there is a small span to be built on the Northumberland side, over the canal. The bridge cost about \$90,000, and was not built by contract but by the Pennsylvania Railroad Co. itself. The iron work cost \$54,000; stone work, \$7,000; erection, \$15,000, and painting, \$3,000. There are six spans. Next year the bridge from the island to the Sunbury side will be built and then the double track will be laid.

Waco, Tex.—The aldermen of Waco, Tex., and the County Commissioners have agreed to build a new bridge across the Brazos River at Waco. The location of the bridge has not been determined.

Washington, D. C.—The South Capitol Street Bridge Association is renewing discussion of the proposal to build a bridge across Anacostia River, on the south side of Washington, to afford better communication between Washington and Prince George's County, Md. The site of the proposed bridge is about half a mile west of the Navy Yard bridge. The Association before mentioned will try to raise funds to promote the scheme.

Windsor, Ont.—The officers of the Michigan Central have informed the City Council that the company has decided upon plans for the proposed bridge on Sandwich street, the structure to cost not more than \$14,400. The City Council has insisted that the railroad should build a much more expensive bridge, but the company will decline to go to any greater expense.

Winnipeg, Man.—Government Engineer Macdonnell has been inspecting the location of bridges at Clearwater, Cartwright, Lauder and Hartney, and tenders are now invited for the construction of three bridges, two at Cartwright and one at Clearwater, Man.

MEETINGS AND ANNOUNCEMENTS.

Dividends:

Dividends on the capital stocks of railroad companies have been declared as follows:

Chicago, Milwaukee & St. Paul, semi-annual, 2 per cent. on the common and 3½ per cent. on the preferred stock, payable Oct. 20.

Chicago, Rock Island & Pacific, quarterly, 1 per cent., payable Nov. 1.

Keokuk & Western, semi-annual, 1 per cent., payable Oct. 10.

Pittsburgh, Youngstown & Ashtabula, semi-annual, 3½ per cent. on the preferred and 3 per cent. on the common stock, payable Sept. 25.

Stockholders' Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Alabama Great Southern, annual, Birmingham, Ala., Oct. 18.

Atchison, Topeka & Santa Fe, annual, Topeka, Kan., Oct. 23.

Boston & Albany, annual, Boston, Mass., Sept. 27.

Brookline & Pepperell, annual, Boston, Mass., Sept. 27.

Chicago, Detroit & Canada Grand Trunk Junction, annual, Detroit, Mich., Sept. 27.

Cleveland, Cincinnati, Chicago & St. Louis, annual, Cincinnati, O., Oct. 25.

Denver & Rio Grande, annual, Denver, Col., Oct. 17.

Evansville & Terre Haute, annual, Evansville, Ind., Oct. 16.

Illinois Central, annual, Chicago, Oct. 18.

Lake Erie & Western, annual, Peoria, Ill., Oct. 4.

Louisville & Nashville, annual, Louisville, Ky., Oct. 4.

Michigan Air Line, annual, Detroit, Mich., Sept. 27.

New York, Ontario & Western, annual, New York City, Sept. 27.

Northern Pacific, annual, Mills Building, New York City, Oct. 19.

Old Colony, special, Boston, Mass., Sept. 26.

Peoria, Decatur & Evansville, annual, Peoria, Ill., Oct. 3.

St. Louis Southwestern, annual, St. Louis, Mo., Oct. 3.

St. Paul & Duluth, annual, St. Paul, Minn., Oct. 12.

Toronto Belt, annual, Toronto, Canada, Oct. 3.

Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The Western Railway Club meets in room 730, The Rookery Building, Chicago, on the third Tuesday in each month, at 2 p. m.

The New York Railroad Club meets at the rooms of the American Society of Mechanical Engineers, 12 West Thirty-first street, New York City, on the third Thursday in each month, at 7:30 p. m.

The Northwest Railroad Club meets at the Ryan Hotel, St. Paul, on the second Tuesday of each month, except June, July and August, at 8 p. m.

The American Society of Civil Engineers meets at the House of the Society, 127 East Twenty-third street, New York, on the first and third Wednesdays in each month.

The Central Railway Club will meet at the Hotel Iroquois, Buffalo, N. Y., on Sept. 27.

Quebec & Nova Scotia Mining Association.

Sept. 28 and 29, the General Mining Association of the Province of Quebec and the Mining Society of Nova Scotia will hold a united meeting in Halifax, N. S.

Northwestern Track and Bridge Association.

At the meeting of this Association held in St. Paul on Sept. 8 it was decided to close the discussions of the paper now before the Association at the December meeting. At that meeting "Construction and Maintenance of Water Tanks" will be discussed.

Technical Education at the Young Men's Institute, New York City.

The educational classes of the Young Men's Institute of the Young Men's Christian Association of the city of New York, at 22 Bowery, will be opened for the season on Oct. 3, at 7:30 p. m. This Institute has for several years been doing a valuable work in offering to young men engaged during the day excellent evening classes in subjects bearing directly on their daily work. There are classes in carriage drafting, steam engineering, practical electricity, mechanical and architectural drawing and free hand drawing; also in practical arithmetic, penmanship, bookkeeping, shorthand, typewriting, English, grammar and composition, vocal music, glee club, and first aid to the injured. The school continues until May, when prizes, diplomas and certificates are awarded. The classes are open to all young men from 17 to 35 years old. Mr. D. E. Yarnell is Secretary of the Institute.

American Society of Railroad Superintendents.

Secretary C. A. Hammond announces that the twenty-third meeting of the Society will be held at the Grand Pacific Hotel, Chicago, on Tuesday, Oct. 12, 1893, at 10:30 a. m. The principal items in the order of business are: Election of new members; report of Executive Committee; reception of delegates from the Master Mechanics', Master Car Builders' and Roadmasters' associations; election of President, Vice Presidents and two members of the Executive Committee. Reports of standing committees: (a) On roadway (J. B. Morford); (b) on machinery (J. F. Divine); (c) on transportation (F. K. Huger); (d) on signaling (J. J. Turner).

Papers are to be read: (a) On telegraphy and telephone service as related to the operating department of railroads, by H. F. Royce; (b) on signal appliances, by W. L. Derr; (c) on the Hobbs Island transfer, by G. D. Hicks; (d) on certain common factors of railroad accidents, by C. A. Hammond. Other prescribed topics for discussion are: (a) catechism for employees, (b) improvements in freight train service; (c) in what ways can maintenance and operating expenses be decreased with regard to true economy? (d) how can a greater efficiency and loyalty on the part of employees be secured?

American Society of Civil Engineers.

The paper for Wednesday evening, Sept. 20, was on the "Water Works of Denver," by James D. Schuyler, M. Am. Soc. C. E.

On Wednesday evening, Oct. 4, a paper will be presented on "The Storage and Pondage of Water," by J. P. Friesz, M. Am. Soc. C. E.

The paper opens with a statement of the stream flow in Massachusetts, showing that 49 per cent. of it occurs in the three months of February, March and April, but 9 per cent. in the three summer months, and 14 percent. in the autumn months. An establishment running throughout the year and depending wholly upon water power cannot use more than 2 per cent. of any part of the stream in one month, or more than 24 per cent. in a year; and even with this use of water it would be exposed to more serious interruption than would thus appear. In August and September the flow would naturally be below the average half the time, and often below 2 per cent. In June and October, also, though the flow is 4 or 5 per cent. upon an average, there would be many days on which it would be below 3 per cent. and even below 2 per cent. The percentages represent the flow for a series of years. Several years will occur sometimes in succession falling 25 to 50 per cent. below the average. No rational use can therefore be made of water power in modern industry without steam power to supply deficiencies in dry seasons, or storage reservoirs to hold back the surplus from high water for use

in time of scarcity. With reservoirs it is possible, though hardly practicable, to make use of the entire flow of the stream. It is not worth while to introduce a steam plant to a greater extent than can be kept in operation for at least three or four months in an average year. This necessarily leaves large volumes of water to run to waste. The use of steam power does not preclude the profitable use of reservoirs.

In a table given, the writer computes the value of reservoirs for use in connection with steam. The elements of this computation are:

First. The quantity of water expected month by month and year by year from a given extent of drainage ground.

Second. The quantity of steam power required to make up the deficiencies and maintain a constant total.

Third. The change in the relative proportions of water and steam consequent upon reservoirs of different sizes.

Fourth. The cost of steam power.

The saving in steam power that can be effected by reservoirs determines the amount that can be judiciously expended in the construction of the latter.

The writer quotes Charles E. Emery, M. Am. Soc. C. E., as to the cost of steam power, and, making an increase on account of greater cost of coal, fixes it at \$31 to \$32 per horse power per annum, or ten cents per working day, or one cent per hour. This is for an engine running constantly at full load, but an engine used for supplementing a water power works under much less favorable conditions; running unloaded it would indicate some 50 H. P., and require the consumption of 6 lbs. of coal per hour. Wages have also to be paid. For these and other reasons the cost of steam per horse power per hour the writer fixes at $\frac{1}{4}$ cents.

He finally deduces from the tables that the annual saving consequent upon a reservoir—

Capacity of 3,000,000 cu. ft. will be.....	\$11,393
Capacity of 5,000,000 cu. ft. will be.....	16,717
Capacity of 10,000,000 cu. ft. will be.....	24,221

This shows that the benefit of reservoirs to a single establishment or one mill privilege will hardly ever warrant the expense of their construction. At least 100 ft. of available head is required to make a project feasible, unless there are exceptional conditions.

If we suppose six establishments on a stream with an aggregate fall of 90 ft., the aggregate saving would be—

For a 3,000,000 cu. ft. reservoir.....	\$88,359
For a 5,000,000 cu. ft. reservoir.....	100,301
For a 10,000,000 cu. ft. reservoir.....	145,323

The cost at which such reservoirs would pay a 10 per cent. interest would be respectively \$228, \$201 and \$145 per 1,000,000 cu. ft. Reservoirs can usually be built in New England valleys at the higher of these rates, but the lower rate would seldom be possible.

A comparison is made between a mill using steam and water power and one using steam alone. The cost of the water power for 1,000 H. P. is placed at \$80,000, and the cost of steam at 20 per cent. more for a constant power. Allowing for interest at five per cent. payment to sinking fund for renewal in 30 years, and for maintenance and care, the cost for power for a year would be \$43,359. The cost for steam for 308 days, 24 hours, at one cent per hour per horse power, would be \$73,920. The last would have the advantage of heating the mill by the waste steam during the winter, but the cost would still exceed that by the combined power.

The tables also throw light on the subject of the absolute cash value of a water power. The difference in cost of steam power alone or steam and water power combined ought to be a measure of the value of the water power. In the case just cited, if \$6,000 be assigned as the value of the heating power, there would still remain \$24,561 as the annual value of the water power, and the mill could afford to pay this sum annually for its use.

Hardly less important than the storage of flow waters is that of pondage or the retention of the flow of a stream, during non-working hours, for use during working hours. Many establishments, such as textile mills, run only during daylight. An establishment running but 10 hours a day must be organized on a totally different basis from one using the same quantity of water and running continuously. All buildings, machinery, boilers, engines, water wheels, raceways, etc., must be about $\frac{1}{2}$ times the size, and pondage (in the case considered) must be supplied for 14 hours' flow, or about 37,500,000 cu. ft. Practically the mills use what pondage they have and allow the night fall to run to waste. The flow of Sundays and holidays runs to waste, and to avoid all waste we should ordinarily have to hold the flow for about 40 hours, requiring 115,000,000 cu. ft. In this connection two tables are given showing the value of pondage under certain conditions, based on the same drainage area as the previous ones. For a mill running 10 hours per day, stopping one hour at noon, making a comparison with the cost of steam power is equivalent to the gain from the pondage. The last table shows the average saving in steam power. For 30 years for pondage of 10,000,000 gallons, it was \$8,240 per year, and for a pondage of 20,000,000 gallons, \$10,918, and the results won't be increased with an increased amount of water used.

The Proceedings of the Engineering Congress and of the Convention will be published in the July *Proceedings*, which members will receive early in October. It has been decided by the Publication Committee that the papers from Division "A" of the Congress shall be printed in the monthly numbers of the *Transactions* beginning with that for July. Every member of the Society will receive these free of cost, as quickly as they can be issued. When all printed they will make two large volumes. The separate numbers can be purchased by others than members at \$2 each, and the separate papers at one cent per page, with an additional charge for plates according to their size. The usual discount will be made to members desiring extra copies.

PERSONAL.

—Mr. Ernest Vliet, formerly General Passenger Agent of the Milwaukee, Lake Shore & Western, died at Milwaukee, Wis., Sept. 15.

—Mr. Walter Scranton, recently Vice-President, has been chosen President of the Lackawanna Iron & Steel Company, in place of Mr. E. S. Moffat, deceased.

—Mr. J. J. Burns, of Pueblo, Division Superintendent of the Denver & Rio Grande, has been chosen President of the Railway Superintendents' Association of Denver.

—Major James I. Neff, a prominent lawyer and politician of Freeport, Ill., died in Chicago on Sept. 14. Major Neff was President of the Chicago, Madison & Northern, and had been attorney for the Illinois Central 18 years.

—Mr. J. G. James, Assistant General Freight Agent of the Lake Shore & Michigan Southern, now has charge of the entire freight traffic of the road, a circular

to this effect having been issued by President Newell since the death of Mr. McKay.

—Mr. S. M. Shattuc, who has been Agent for the Ohio & Mississippi road at Denver, Col., for 10 years, has been transferred to St. Louis, where he will be Passenger Agent. Mr. Shattuc's friends in Denver gave him a gold watch just previous to his departure.

—Mr. Mariano Garfias has resigned the position of Government Inspector of the National Tehuantepec, to be succeeded by Mr. Fiacro Quijano, until now Government Inspector of the Mexican Central. Mr. Garfias will take the position vacated by Mr. Quijano.

—Mr. John Parry, Superintendent of Government Railroads, New South Wales; Mr. Walter Shelshear, Division Engineer, and Mr. H. Howe, Master Mechanic, on the same lines, are on a visit to the United States. They were in Denver last week on their way eastward.

—Mr. Charles H. Babcock, who has been appointed Assistant Land Commissioner of the Great Northern, is a resident of Minneapolis, where he has for many years been engaged in the practice of law, giving particular attention to the branch relating to real estate. Mr. Babcock's headquarters are at St. Paul, Minn.

—Mr. Moses Boyd, of Dedham, Mass., has just celebrated the completion of 50 years' service as railroad conductor on the Boston & Providence and its successors, the Old Colony and the New York, New Haven & Hartford. Mr. Boyd's brother conductors presented him with a gold-headed cane.

—Mr. W. J. McKee, lately Superintendent of the Newport News & Mississippi Valley road, at Paducah, Ky., has gone to the St. Louis, Iron Mountain & Southern taking the place of Mr. J. E. Rose, Superintendent of the Central Division at Little Rock, who has been promoted, as appears from a notice in another column.

—Mr. Thomas G. Clayton, of Derby, Superintendent of Construction of the Midland Railway of England, was among the passengers on the new steamship "Lucania." He comes as a guest of his brother, Mr. James Clayton, President of the Clayton Air Compressor Works, New York, and while here will visit the World's Fair and make a study of the railroad systems of this country.

—Mr. Jacob S. Leib, Treasurer of the Northern Central, dropped dead in the street near his home in Baltimore, Md., on Sept. 18. The cause of death was congestion of the brain. Mr. Leib was 68 years old. He was appointed Secretary of the York & Cumberland Railroad in 1849; that road was absorbed by the Northern Central in 1854, and he had been Treasurer of that company continuously ever since that date.

—Mr. John E. Davidson has been elected Third Vice-President of the Pennsylvania company and of the Pittsburgh, Cincinnati, Chicago & St. Louis Railroad Company, in the place of Mr. Thomas D. Messler, deceased. Mr. Davidson has had charge of the Treasury Department of these lines, as Fourth Vice-President, to which position he was elected in April, 1891. He was previously Treasurer of the lines.

—Mr. J. G. Callahan, Purchasing Agent of the Duluth & Winnipeg, died at Duluth, on Monday, of enlargement of the heart. At one time he was Purchasing Agent for the Eau Claire lumber companies. From 1882 to 1889 he was Land Commissioner and Purchasing Agent of the St. Paul & Duluth, and in 1889 resigned to accept the position held by him at the time of his death. Mr. Callahan was loved and respected by all who knew him.

—Ober-Baurath Klose, of the Württemberg state railroads, is among the visitors at the World's Fair. Mr. von Borries, of Hanover, prominent in German railroad circles; Dr. Diefenbach, of Stuttgart, and Dr. Wedding, of Berlin, also are at Chicago, as representatives of the German Government, while Drs. Roesing, Schräder and Schrey, and Profs. Nebel, Höfinghoff and Wilhelm have been specially delegated by the German Patent Office to visit the exhibition.

—Mr. Henry Lambert, General Manager of the Great Western of England; Mr. William Ingalls, Chief Engineer, and Mr. William Dean, Mechanical Superintendent of the company, who came to this country a few weeks ago to visit the World's Fair and inspect the railroad system, sailed from New York on Saturday, Sept. 16. On Tuesday, Sept. 12, they were entertained at dinner in Philadelphia by Vice-President Pugh and Mr. Ely, Chief of Motive Power of the Pennsylvania.

—Sir Alexander T. Galt, K. G. C. M. G., formerly a prominent figure in Canadian public affairs, died in Montreal on Sept. 19, at the age of 76. He was born in Chelsea, England, and went to Canada while quite young. He entered Parliament for the County of Sherbrooke in 1849, and was re-elected in 1853. He was connected with the construction of the Atlantic & St. Lawrence Railroad, between Montreal and Portland, and was instrumental in obtaining its amalgamation with the Grand Trunk. In 1857 he was appointed one of the Government Directors of the Grand Trunk.

—Mr. David J. Mackey, of Evansville, Ind., was elected President of the Evansville & Terre Haute Railroad at a meeting of the directors in New York City on Sept. 13. Mr. Mackey succeeds Mr. George J. Grammer who was elected to the presidency in November, 1892, the latter having been Traffic Manager of the road during the former administration of Mr. Mackey, holding the same position on the roads commonly known as the Mackey system. Mr. Mackey recently secured control of a large amount of the stock of the company and a few months ago was elected President of the Board of Directors of the company. Mr. W. H. Tilford, of New York City, who was elected a director of the company this spring with Mr. Mackey, becomes President of the Board of Directors.

—Mr. Charles Neilson, late General Superintendent of the Cincinnati, Hamilton & Dayton, has been appointed Assistant General Superintendent of the Railway Mail Service, with office at Washington, D. C., to succeed Mr. W. P. Campbell, resigned. Mr. Neilson's long experience as an operating officer in railroad service, with his standing and ability as an executive officer, make this appointment an especially fit one. His knowledge of railroad affairs will be of invaluable service to the Post Office Department and to the public and railroad companies as well, in any reorganization of the present system of the railroad postal system that may be undertaken, and the improvement of the system will undoubtedly receive his early attention. Mr. Neilson was for four years Division Superintendent on the New York, Lake Erie & Western, his headquarters being at Buffalo for part of the time, and he then became acquainted with Postmaster-General Bissell. In 1886 he went to the Cincinnati,

Hamilton & Dayton as General Superintendent and continued in that position until a few weeks ago.

—Achilles Thommen, one of Austria's most prominent railroad engineers, died on Aug. 21, at the age of 62 years. Mr. Thommen was Swiss by birth, and after graduating at the technical school at Carlisle began his engineering career, in the year 1857, in the service of the Central Railroad of Switzerland. In this he remained for 10 years, going to Hungary in 1867 to cooperate in the development of the railroads of that country, ultimately becoming chairman of the commission under whose general direction the various government roads were laid out and built. Failing health having compelled him to resign this office after a few years, he removed to Vienna, where he devoted himself to private work, taking an active interest in various prominent engineering undertakings, among them the St. Gotthard and the Arlberg railroads, and the Vienna rapid transit problem. Mr. Thommen was one of the directors of the Northwestern Railroad of Austria, Vice-President of the Danube Steamship Co., and President of the Vienna Brick Works. He was also one of the oldest members of the Austrian Railroad Club.

—Mr. Frederick L. Ames, the well known Boston capitalist, was found dead in his stateroom on the steamer "Pilgrim," of the Fall River Line, on the morning of Sept. 13, death having resulted from apoplexy. Mr. Ames was 58 years old. He was the son of the late Oliver Ames, and cousin of Oliver Ames, ex-Governor of Massachusetts. He was reputed the wealthiest man in Massachusetts, his fortune being estimated at \$35,000,000. He was graduated at Harvard University in 1854, and began practical life in the Ames manufacturing establishment at North Easton. He became a member of the firm in 1863. He soon afterward became interested in railroads, and railroad building and management came to be his chief business interest. At the time of his death he was officially connected, generally as director, with about 40 roads, among which were the Old Colony, the Fitchburg, the Union Pacific, and the Chicago & Northwestern. He was also a director of the Western Union Telegraph Co. and the General Electric Co. He was prominent in Boston charitable institutions and in the First Unitarian Church of Boston. He had taken little interest in politics, but was in the State Senate in 1872. Mr. Ames leaves a widow, two sons and three daughters. Mr. Ames will be published on Monday. Liberal provision was made for Mrs. Ames, and the rest of the property was left in trust for the five children, who are to share equally.

ELECTIONS AND APPOINTMENTS.

Burlington, Cedar Rapids & Northern.—M. M. Knapp has been appointed Division Freight Agent with headquarters at Estherville, Ia.

Chicago Great Western.—J. J. Ford has been appointed assistant to the Superintendent and Superintendent of Telegraph. J. McNab has been appointed Chief Train Dispatcher at Oelwein, vice W. J. Stinson, transferred. The jurisdiction of J. A. Kelly, Division Superintendent at Chicago, has been extended to include the Dubuque Division. J. J. McLaughlin has been appointed Superintendent of the St. Paul Division, with jurisdiction from Minneapolis to Elma, Ia. B. F. Egan, Division Superintendent at Dubuque, Ia., has been appointed Superintendent of the Des Moines, St. Joseph and Kansas City divisions, with headquarters at Des Moines, Ia., vice L. B. Ridpath, transferred.

Chicago Great Western.—At the annual meeting of this company held in Chicago Sept. 7, H. E. Fletcher, H. A. Gardner, and A. Oppenheim were re-elected directors to serve for three years.

Columbus Southern.—A. H. Morris, formerly Trainmaster and Car Accountant, has resigned and that office has been abolished. All reports relating to the movements of cars should be addressed to the Auditor, W. C. Waters, Columbus, Ga.

Dakota, Wichita & Gulf.—The officers of this road, which was referred to in our issue of Sept. 8 as the Dakota & Gulf, are as follows: President, E. R. Powell; Secretary, W. B. Cook; Treasurer, T. K. McLean, Wichita, Kan.; Vice-President and General Manager, C. M. Rawlings, Lyons, Kan.; Chief Engineer, Edward Roemer, New York City.

Evansville & Terre Haute.—A. G. Palmer has been appointed General Passenger and Ticket Agent, with office at Evansville, Ind., in place of S. D. McLeish, resigned. Mr. Palmer came from the Louisville, Evansville & St. Louis, where he was Assistant General Freight and Passenger Agent.

Great Northern.—R. W. Bryan, Superintendent of the Breckinridge Division, has been promoted to be Assistant Superintendent of the Eastern Division. O. O. Winter has been appointed Superintendent of the Breckinridge Division, with headquarters at Minneapolis, Minn., to succeed R. W. Bryan, promoted.

Charles H. Babcock has been appointed Assistant Land Commissioner, with headquarters at St. Paul, Minn.

Kennebec Central.—At the annual meeting held in Gardiner, Me., the following directors were re-elected: Weston Lewis, A. C. Stilphen, J. S. Maxcy, H. W. Jewett, J. B. Dingley. H. S. Webster was elected Secretary and P. H. Winslow, Treasurer, both of Gardiner, Me.

Mexican Central.—The Guadalajara Division has been abolished and that portion of the line has been consolidated with the Mexico Division, with E. E. Styner, Superintendent. J. J. Sullivan has been appointed Trainmaster and Roadmaster of the Guadalajara branch.

Montgomery, Haynesville & Camden.—The annual meeting of this company was held in Camden, Ala., Sept. 13, and the following directors were re-elected: J. T. Beck, I. E. Starr, R. B. McWilliams, S. D. Bloch and D. Palmer. S. D. Bloch was re-elected President, and R. E. McWilliams, Secretary and Treasurer.

Nashville, Chattanooga & St. Louis.—The annual meeting of this company was held in Nashville, Tenn., Sept. 13, and the following directors elected: J. W. Thomas, G. M. Fogg, J. S. Rogers, A. H. Robinson, Nashville, Tenn.; J. E. Washington, Cedar Hill, Tenn.; L. H. Lanier, Sr., M. Burns, J. H. Eakin, Nashville, Tenn.; E. S. Jordan, Murfreesboro, Tenn.; T. W. Evans, New York City; N. C. Collier, E. B. Wesley, J. G. Aydelott, Tullahoma, Tenn.; J. D. Probst and O. H. P. Belmont, New York City. The following officers were re-elected: J. W. Thomas, President and General Manager;

J. H. Ambrose, Secretary and Treasurer, J. D. Maney, Comptroller, and Hunter McDonald, Chief Engineer, all of Nashville, Tenn.

Pennsylvania Company.—John E. Davidson has been elected Third Vice-President, to fill the vacancy caused by the death of Thomas D. Messler. The office of Fourth Vice-President is abolished.

Pittsburgh, Cincinnati, Chicago & St. Louis.—John E. Davidson has been elected Third Vice-President, to fill the vacancy caused by the death of Thomas D. Messler. The office of Fourth Vice-President is abolished.

Portland & Rumford Falls.—At the annual meeting of the company last week the following officers were chosen: President, Hugh J. Chisholm, Portland, Me.; Superintendent, L. L. Lincoln, Rumford Falls; Treasurer, R. C. Bradford, Portland; Directors, Hugh J. Chisholm, Daniel F. Emery, Jr., Portland; George C. Wing, Auburn; George E. Bisbee, Buckfield; Waldo Pettingill, Rumford Falls; Geo. W. Russell, Lawrence, Mass.; Galen C. Moses, Bath, Me.

Port Jervis, Monticello & New York.—The annual meeting of the stockholders of the company was held Sept. 7, at which the following directors were chosen: P. E. Farnum, Francis Marvin, Benjamin Ryall, Wade Buckley, C. E. Cuddeback, Dr. Sol. Van Etten, Stephen St. John, W. H. Nearpass, of Port Jervis, N. Y.; C. G. Bennett, of Wurtsboro; W. B. Royce, of Middletown; A. J. Hardenburgh, of New York City; C. V. R. Ludington, Monticello; Wm. Norris, Godeffroy, N. Y. The following officers were chosen: Benjamin Ryall, President and General Manager; Wade Buckley, Vice-President; W. H. Nearpass, Secretary and Treasurer. Mr. Farnum, who has been President of the road since November, 1887, declined to serve longer in that capacity, because of the demands of his private business.

Roanoke & Southern.—The stockholders of the company met at Roanoke, Va., Sept. 12, and elected the following officers: F. H. Fries, President; H. S. Trout, Vice-President; A. J. Hemphill, Secretary, and Walter G. MacDowell, Treasurer.

Sioux City Rapid Transit.—The annual meeting was held in Sioux City, Ia., Sept. 2, and the following directors elected: James A. Jackson, A. V. Larimer, Edward Haakinson, A. M. Jackson, W. E. Higman, A. S. Wilson, E. C. Peters. The directors elected the following officers: President, A. M. Jackson; Vice-President, A. V. Larimer; Secretary, E. C. Peters, and Treasurer, Edward Haakinson.

St. Louis, Iron Mountain & Southern.—J. E. Rose has been appointed Superintendent of the Arkansas Division in place of W. T. Kelly, resigned. W. J. McKee takes the place of Mr. Rose as Superintendent of the Central Division. Both offices are at Little Rock, Ark.

St. Johnsbury & Lake Champlain.—The annual meeting was held in St. Johnsbury, Vt., Sept. 14, and the following directors were elected: Carroll S. Page, Hyde Park, Vt.; S. C. Shurtliff, Montpelier, Vt.; H. E. Folson, Lyndonville, Vt.; George W. Hendee, Morristown, Vt.; Franklin Fairbanks, St. Johnsbury, Vt.; Samuel C. Lawrence, Medford, Mass.; Henry R. Reed and W. T. Hart, Boston, Mass., and C. E. A. Bartlett, Chelmsford, Mass.

Texas & Pacific.—J. B. Keefe has been appointed General Western Agent at Denver, Col., in place of W. A. Murden, resigned.

Toledo & Ohio Central.—The annual meeting was held in Toledo, O., and A. W. Scott, of Toledo, O.; C. Ledyard Blair and J. S. Stanton, of New York City, were re-elected directors to serve for three years.

Toledo, Peoria & Western.—The annual meeting of the railroad was held at Peoria, Ill., on Sept. 11. The election resulted in the choice of the following Board of Directors: J. A. Roosevelt, J. W. Stirling, Adrian Iselin, Jr., W. H. Gebhard, New York; Franklin H. Head, H. F. Perkins, M. H. Bennett, E. H. Durkee, Chicago; E. F. Leonard, Peoria.

Toledo, St. Louis & Kansas City.—The following directors were elected at the annual meeting held in Toledo, O., Sept. 13: S. H. Kneeland, Lansdale Boardman, R. G. Ingerson, W. H. Gilder, Joseph S. Stout, F. L. Russ, J. O. Osgood, New York City; Franklin J. Sawyer, Buffalo, N. Y.; Clarence Brown, S. R. Callaway, F. L. Geddis, M. L. Crowell, Toledo, O., and Charles P. Miller.

Weatherford, Mineral Wells & Northwestern.—A meeting of the directors was held in Weatherford, Tex., Aug. 31, and the following officers elected: L. M. Fouts, President; S. M. Finley, Vice-President, and E. R. Standish, Secretary and Auditor.

RAILROAD CONSTRUCTION, INCORPORATIONS, SURVEYS, ETC.

Abbeville Southern.—The President of this road tells a Montgomery reporter that it will be opened in a few days from Abbeville Junction, on the Alabama Midland, northward to Headland, Ala., about 15 miles. The road is projected to extend about 30 miles further northward to Abbeville, connecting that town with the Alabama Midland. The line lies through a good agricultural country and it is expected to open it for business the whole length about the middle of November.

Bangor & Aroostook.—The work on this road through Maine is now being vigorously pushed on both the Brownville and Houlton divisions. The tracklaying especially is making very good progress and the rails have now been laid from Brownville, the southern terminus of the new part of the road, for 25 miles, and from Houlton the rails have been laid for nearly 40 miles to the Penobscot County line. The grading is now nearly finished, and as the men are taken off this work they are added to the tracklaying gangs. Nearly 2,000 men are now at work on the unfinished sections.

Bellefonte Central.—The work of grading has been practically completed and track laid from near Bellefonte, Pa., to Hublersburg. On Sept. 12 the first consignment of goods was shipped via the Bald Eagle Valley, from Valentine Furnace to Hecla over the new line, and in about two months regular traffic will begin. The stone work of the bridges along the route is well advanced. There will be five iron girder bridges, all of which will be completed inside of a month. Work has been commenced on the Zion station.

Canadian Pacific.—General Superintendent Abbott, Vancouver, B. C., is calling for bids for the grading of 10 miles of the Arrow Lake Branch of this road, from Revelstoke south. Workmen are still engaged in clearing the right of way.

Denver & Rio Grande.—Levy & Moore have finished the grading for a two-mile branch extending the Chandler Creek branch up Bear Gulch to the United Coal Company's new coal mine near Florence, Col. The mine has a capacity of 500 tons a day. The rails are being laid and it is expected that the road will be open for traffic by Oct. 1.

Duluth & Iron Range.—The profiles of the proposed short line to the Mesaba Iron Range have been completed and a map showing the route to be followed has been filed with the Secretary of State of Minnesota. It will leave the main line about two miles south of Two Harbors and run as nearly as may be in an air line to the range. The new line will be 65 miles long and, with some short branches to be built, will make about 75 miles of main line to be constructed. It has not yet been determined whether the work will be begun this fall or not, but, as there is some heavy work that can be accomplished during the winter, it is more than probable that the contract will be let before snow flies. There are very few curves and the heaviest grade will be 30 ft. per mile. R. Angst, Chief Engineer, Duluth, Minn., is in charge of the work.

Edinburg & Erie.—A charter for this line was filed at Harrisburg, Pa., on Sept. 9, the capital stock being \$200,000. Edinburg, which is given as the southern terminus of the proposed line, is a small town in Lawrence County, near the Ohio state line, and about 70 miles from Lake Erie.

Gladeville.—The grading of the railroad from the Cherry Place, on the Norfolk & Western, to Wise C. H., a distance of 3½ miles, was, on Sept. 7, let to Messrs. Wing & Horneck, of Johnson City, Tenn. The grading is to be completed within six months from the date of contract, or in less time if so desired by the company. E. M. Fulton, of Wise, C. H., is President of the company.

Lancaster, Oxford & Southern.—Chief Engineer Nevin has completed the survey of the proposed extension from a point near Kingsbridge Station, up the west branch of the Octoraro, to Quarryville. This is the first railroad survey ever made up the west branch. The line leaves the Octoraro at Quarry Valley and runs up the depression to Quarryville, a distance of eight miles. The distance from Quarryville to Child's Station, on the Baltimore & Ohio, will be about 20 miles.

La Porte, Houston & Northern.—General Manager T. W. Lee, of Houston, expects the rails for the main line to reach Texas about Sept. 25. Work will begin immediately laying the track from Harrisburg, near Houston, to La Porte or Trinity Bay, about 16 miles. Grading has already begun for the extension to Clear Creek and the connection with the North Galveston & Houston roads.

Nevada Southern.—The Nevada Southern Construction Company, of Denver, Col., with a capital stock of \$100,000, has been incorporated to build the road of this company. The line extends from Goff's, Cal., north to Good Springs, Nev., 100 miles. The incorporators of the construction company are: George C. Manley, William L. Beardmore and Charles B. Mason, of Denver.

New Roads.—R. B. Cheney, of Lee, Mass., is engaged in forming a corporation in Massachusetts to take over the abandoned roadbeds of the Lee & Hudson and Lee & New Haven roads, and to complete a line from State Line, N. Y., through Lee to Winsted, Conn., to compete with the Housatonic. A meeting was held at Lee last week to farther the interest of the projects. It is stated that the funds to complete the 30 miles of new road proposed have been raised in New York. C. C. Higgins and George S. Bowers are among the New York projectors, and F. M. Pease and John Stallman, of Lee, are local directors.

A short branch is being built to reach the coal mines in Boone County, Ia., by Hamilton Browne, of Des Moines, and the other principal owners of the mines. The road makes a junction with the Minneapolis & St. Louis near Bluff Creek and extends easterly, crossing the Des Moines River to the mines at Pilot Mound, Ia.

Ottawa, Arnprior & Parry Sound.—Rapid progress is being made in construction work on this railroad. It is expected that rails will be laid into Renfrew before a month and into Eganville by the middle of November. The company is now applying for the bonus of \$50,000 voted by the city of Ottawa, to be paid when the road should be completed to Arnprior. The contract for 10 miles from Indian Point, Golden Lake, to Killaloe, will be awarded this week. There were seven bids entered for it.

Pittsburgh, Virginia & Charleston.—The construction work on this road is still suspended, and it is not known when the work of extending the branch will be resumed. The grading has been completed, and part of the ties and rails for the road are on the ground. When the Pennsylvania began to reduce expenses, practically all construction work was stopped, the Peters Creek branch among the rest, although the material for its completion had been delivered on the ground. The road will tap a rich coalbed.

Quebec & Lake St. John.—The Chicoutimi Extension to the Saguenay River has not yet been reopened. The contractor has had difficulty in retaining a fair number of men on the work, and several strikes have also retarded progress. The Government engineers inspected the last section to Chicoutimi, Que., last week and authorized the extension to be opened for traffic. This company expects to do in about a week. The new line begins at Chambord Junction, at Lake St. John, and extends east to Chicoutimi, 50 miles. The line was completed and opened for traffic in July, but extensive washouts occurred soon after and compelled the company to discontinue trains.

Red River Valley & Western.—Daily freight trains are now run on this road, which was built this summer from Addison, N. D., near Fargo, west to the new town site of the America & Sharon Land Co. The grading was done through funds raised by the farmers in the three townships through which the line passes and the land company. The rails were laid by the Great Northern, the new road being a feeder to that line, reaching a productive wheat district. The length of line now in operation is 12 miles, but it is proposed to extend the line much farther next year. Frank Lynch, of Casselton, N. D., is President.

Southern Pacific.—The construction work on the new coast line has just begun in the town of San Luis Obispo, Cal., the terminus of the work now under contract. The masonry for the iron bridge across the San Luis Creek, near the town, is now being built; practically all the other bridgework on the section, except the erection of some of the ironwork, being completed. There are several tunnels on the line between Santa

Margarita and San Luis Obispo, and this work is still going on. The grading is practically suspended on most of the line until the contractors finish the boring of these tunnels. All the work is let to George Stone & Co., of San Francisco. The contract includes 8,000 ft. of tunneling in seven tunnels, the largest being 3,600 ft.

Texarkana & Fort Smith.—The road is now being operated to Allene, Ark., near the Little River, to which the extension from Texarkana, Tex., has been recently completed. Allene is a new town less than 10 miles north of Wilton, Ark., which has been the northern terminus since January last.

Texas & Gulf.—The grading was begun south of Marshall, Tex., a few weeks ago with a small force. The officers state that this force is to be considerably increased this week. The road is projected from Marshall via Center to the Gulf of Mexico at or near Sabine Pass. The road is graded about 14 miles south from Marshall, and the survey is about completed to Center; the contract for the building of the first 60 miles is let to W. L. Bennett, of New York. The work is comparatively light with one per cent. maximum grade. The principal traffic will consist of timber and agricultural products, the route being through a virgin forest of long leaf yellow pine, black walnut and cypress, besides passing through fine farming district. The following officers have been elected: E. J. Fry, President; L. W. Gandy, Vice-President; W. C. Pierce, Treasurer, and C. D. Lancaster, Secretary. The principal office is at Marshall, Tex.

Tivoli Holler.—The rails and other construction material for this short road at Albany, N. Y., also called the Albany Terminal, have arrived at Albany, and the work will soon be commenced. The road is being built under the supervision of Walter Melins, Chief Engineer, from the river point to a connection with the New York Central & Hudson River road.

Wilkes-Barre & Eastern.—The officers of the company expect to have the construction work completed early in October. Nearly all the contractors have left work and the construction is being finished under the direct charge of the construction company. The road now approaching completion is 60 miles long from Stroudsburg, Pa., on the New York, Susquehanna & Western, to Wilkes-Barre. W. P. Ryman, of Wilkes-Barre, is President of the company.

Youghiogheny & Wick Haven.—The Youghiogheny & Wick Haven Railroad was incorporated in Pennsylvania last week with a capital stock of \$18,000, to build a railroad from Banning Station on the Pittsburgh, McKeever & Youghiogheny to Wick Haven, Fayette County, Pa., one mile. The directors are: Frank Morrison, Simon Perkins, James S. Fruit, Sharon, Pa.; Edwin S. Templeton, Greenville, Pa.; Julian E. French, Cleveland, O., and Henry H. Wick, Youngstown, O. The President is Frank May, Girard, Pa.

GENERAL RAILROAD NEWS.

Canadian Pacific.—The passenger department of this road announces that the through transcontinental passenger line by way of St. Paul and Minneapolis will be opened Sept. 24. The new portion of this line is the extension of the Minneapolis, St. Paul & Sault Ste. Marie (controlled by the Canadian Pacific), so that there is now a direct line from Minneapolis northwestward to Pasqua on the main line of the Canadian Pacific, 390 miles west of Winnipeg. The Canadian Pacific, through its controlled road, thus has a duplicate line from Sudbury, Ont., westward to Pasqua. Pasqua is 33 miles west of Regina and about 1,371 miles west from Sudbury, by the main line of the Canadian Pacific. The new road is owned and operated directly by the Canadian Pacific from Pasqua southeast to North Portal, which is on the border line between Assiniboina and North Dakota, 550 miles from St. Paul, and for the rest of the distance is in the hands of the "Soo" line. The announcement states that there will be through passenger trains from Montreal to St. Paul and Minneapolis and from those cities to the Pacific Coast. The connection at Stirling (North Portal) was made in August, and since then about 40 miles of track has been laid in Assiniboina from Estevan, northwest to Pasqua. The distance from Pasqua to the International boundary is 106 miles.

Chicago, Milwaukee & St. Paul.—The directors of the company this week declared the regular dividends of 3½ per cent. on the preferred and two per cent. on the common stock. The dividends are payable out of the earnings for the year ended June 30, which showed about six per cent. earned on the common stock. President Roswell Miller, in speaking of the present outlook for traffic, said that the crops along the line, taking them all together, will be about the same as last year. There will be as much grain to move as ever. Manufacturing industries are very much depressed. Most of the mills are closed, or are curtailing work. There has been some improvement lately, but not enough yet to make a material impression upon earnings.

Cleveland, Canton & Southern.—This road has been placed in the hands of a receiver, the company having applied to the court at Cleveland for such action on Sept. 15. It is stated that the road is perfectly solvent, but that the earnings have decreased 40 per cent., and it is necessary to place the property in the hands of the court in order to prevent litigation and dissipation of the funds of the company. Judge Ricks appointed as Receivers Mr. J. W. Wardwell General Superintendent of the road, and Mr. Frederick Swift, of New Bedford, Mass. The estate of the late William J. Rotch, of New Bedford, is one of the chief owners of the road. The main line of this road extends from Cleveland to Zanesville, 145 miles, and there are 65 miles of branches.

Fitchburg.—The stockholders will be asked to consider, at the annual meeting in Horticultural Hall, Boston, on the 27th of this month, a proposition to authorize the directors to issue from time to time the bonds of the company to an amount not exceeding \$2,500,000, to provide means for the payment of bonds maturing April 1, 1894, and for funding the floating debt. The annual report of the company shows the total income for the last fiscal year to have been \$7,707,297; operating expenses, \$5,542,689; net earnings, \$2,164,608; dividends paid, \$668,133; surplus carried to improvement fund, \$31,652. The company has paid \$124,179 on account of the fatal accident at West Cambridge, Sept. 10, 1892, and six claims are unsettled.

Galveston, Harrisburg & San Antonio.—The State of Texas has recovered 800,000 acres of valuable land from this road, the judgment being rendered by Judge Giles, at Alpine. The land in question lies in Brewster, Pecos, Presidio and Jeff Davis counties, and the claim of the state was founded on the allegation that the certificates were issued at a time when no law existed authorizing them. The road will appeal the case.

Jacksonville, Mayport & Pablo Railway & Navigation Co.—On the application of G. F. Brougham and N. B. Broward, before the Circuit Court of Duval County, Fla., Charles S. Adams has been appointed Receiver of this road. This is a short road extending from Jacksonville to Mayport, Fla., 17 miles.

New York, New England & Northern.—An application is pending before the New York State Railroad Commissioners at Albany for permission to construct this road. This is the proposed line to connect the New York & New England at Brewster's with New York City. The company was incorporated in July last, and the southern terminus named in the articles of incorporation is Leggett's Point, on the Harlem River. The present application is opposed by the counsel of the New York, Boston, Albany & Schenectady Railroad, which was chartered to build in the same territory in 1880, but has done no work, and by the New York & Northern, whose line extends from Brewster's to New York City. President McLeod, of the New England road, claimed that the New York & Northern did not serve its territory well enough to warrant it in demanding that no competing line be constructed, and asserted that the capital to construct the new road was ready.

Northern Pacific.—Messrs. August Belmont, J. Horace Harding, Brayton Ives, Donald Mackay and Winthrop Smith have issued a circular to stockholders asking for proxies for the coming election. These gentlemen call attention to the disastrous financial results of the past few years and propose to work for the election of an economical and intelligent management. They will seek the co-operation of all in the present board whom they believe to be loyal to the interests of the company.

In the suit before the United States court at Milwaukee the receivers of the road have recommended the granting of the Wisconsin Central's petition for the return of the latter road to the original owners, thus abrogating the lease. The Chicago & Northern Pacific has filed an intervening petition to have the Wisconsin Central enjoined from taking possession of the Wisconsin Central and Chicago & Northern Pacific roads, and to compel the Northern Pacific to operate both lines.

Philadelphia & Reading.—The company's counsel have prepared an opinion on the nature of the security of the Receivers' certificates authorized by the court on July 6. The counsel say that such certificates stand upon the same footing as the cost and expenses of the cause, that is to say, they are a first charge upon all the property and earnings of the company, and the faith of the court is pledged not to permit the possession of the property to pass from its hands until the certificates are paid or provided for. The decree of the court establishes that the claims for which the certificates were authorized are entitled to preference over any other claims upon the property, and this preference is transferred to the certificates, which have been authorized by the court to provide the means for the payment of said claims. It is this technical priority over other claims upon the property which leads to objection on the part of mortgage bondholders; but it is obvious that the courts must enforce the rights of the certificate holders, with due regard to the equities of other lien creditors, and, as the Philadelphia & Reading Railroad Company is the owner of sufficient personal property, if the materials and supplies always on hand be included, to pay all probable debts of the receivership, while the net earnings of two or, at the outside, three months would always suffice for the purpose, there is scarcely a possibility that the occasion will ever arise to disturb the lien of any mortgage. In fact, in every railroad reorganization it is essential that the debts of the receivership should be first provided for. In that of 1883 of this company it was done by the sale of the deferred income bonds; in 1888 by the sale of the first preference income mortgage bonds, and similar provision must be made before the present Receivers can be discharged.

The monthly statements of earnings show that, for the four months ending July 31, 1893, the net earnings were \$3,419,857, as against \$3,316,577 for the same period of 1892, an increase of \$102,810, at a time of great extraordinary depression in business circles. The increase in net earnings was almost wholly due to decreased expenses. The net earnings for the four months ending March 31, 1893, were \$2,619,341, as against \$3,308,164 for the same period of 1892, a loss of \$688,823. This loss was due to the severity of the winter months. The announcement of the contract with Coxe Bros. & Co. took effect on Aug. 16. During the month of August 73,450 tons of Coxe Bros. & Co.'s coal were transported over the Reading road. During the first half of the month 37,085 tons of coal were carried under the old division of rates, and in the latter half 36,374 tons under the new division, the result being that the business of the month netted the company \$15,079 more than it would have done under the old division.

Portland & Rumford Falls.—The last report of the company's operations states that the traffic on the Rumford Falls extension has been very satisfactory. The road was opened Aug. 1, 1892. The total cost of the extension to June 30, 1893, from Gilbertville to Rumford Falls, including terminal facilities, but exclusive of equipment, is \$288,797. A favorable contract for a long term of years has been executed with the Maine Central, so that, when the extension now building is completed, the terminals of the road will be, practically, at the cities of Lewiston and Auburn at the southerly end and Rumford Falls at the northerly end. The present mileage of the road, Rumford Falls to Mechanic Falls, is 42 miles; extension now in process of construction, Mechanic Falls to the connection with the Maine Central, 11½ miles; running right over the Maine Central to Lewiston, 3½ miles; making a line 57 miles long.

Quebec.—The government of this province recently took advantage of certain non-compliances on the part of a number of railroad corporations with the terms of the law to strike off and cancel the subsidies voted to them under the Mercier administration. The canceled subsidies amount in all to some \$3,000,000.

Seattle, Lake Shore & Eastern.—The first mortgage bondholders have appointed M. S. Paton, H. O. Armour, J. D. Smith and E. D. Christian a committee to protect their interests. About \$1,500,000 worth of bonds has been deposited with the Manhattan Trust Co. under an agreement empowering the committee to bring any suits necessary, and to get possession of the property by foreclosure proceedings. Default in the payment of interest on first mortgage bonds was made on Aug. 1 by the Northern Pacific, to which the road is leased.

Southern Pacific.—The recording of a mortgage for \$80,000,000 on the lines of this company in California, to secure bonds of the same amount, was referred to last week. President C. P. Huntington has given some particulars of the plans of the company in authorizing the

issue of these bonds. The new mortgage, he says, will be a first lien on all of the company's property, including the lands. The company has built during the past two years over 100 miles, on which there is no mortgage at all, and the new mortgage will be a first lien on this mileage. As the present outstanding bonds mature, they will be taken up by this mortgage and will be exchanged, probably before their maturity, for the new bonds. The remainder of the new bonds will be issued gradually, and only as the construction of new roads made necessary by the increasing local traffic justifies such issue. The consolidated mortgage bonds bear five per cent. interest and will retire six and seven per cent.

Union Pacific.—The statement of earnings for July and the fiscal year to July 31 was issued last week. The report for the whole system is given in the following table:

	Month of July.	1893.	1892.	Dec.
Gross earn.....	\$2,828,874	\$3,750,150	\$921,276	
Oper. expenses.....	2,044,294	2,211,168	196,874	
Net earn.....	\$784,580	\$1,535,982	\$724,402	
<i>Seven Months—Jan. 1 to July 31.</i>				
Gross earn.....	\$22,022,684	\$23,728,423	\$1,705,739	
Oper. expenses.....	15,720,800	15,735,672	14,372	
Net earn.....	\$6,301,884	\$7,992,751	1,690,867	

Union Pacific, Denver & Gulf.—Ex-Governor Evans' suit for a receiver for the above company has been transferred from the District Court at Denver to the United States Circuit Court. Affidavits were presented to the effect that after the transfer of the road to the Union Pacific it ceased to do business as an independent line, and that traffic which should have been carried over the road under the terms of the agreement with the Union Pacific was sent over the other lines of the latter company. E. F. Arthur, Chief Clerk to Manager C. F. Meek during the time the road was independently managed for several months following the consolidation, deposes at great length alleging that the shipment of cattle from the south into Wyoming was done at a loss to the Fort Worth Division and that its share in the coal trade was not a fair one; that contracts for the shipment of commodities were broken so that the business might be routed by way of Omaha instead of via the gulf ports. Judge Hallett will hear the case shortly. Ex-Governor Evans, who began these proceedings a few weeks ago, was one of the chief projectors of the line, and was formerly President of the company.

Wabash.—The annual report just published is for the year ending June 30 last. The following is a summarized table of earnings and expenses:

	1893.	1892.	Inc. or dec.
Gross earn.....	\$14,220,444	\$11,389,331	D. \$68,887
Oper. expen.....	10,807,604	10,832,527	D. 24,923
Net earn.....	\$3,412,840	\$3,556,804	D. -\$143,964
P. c. oper. exp. to earn.....	76	75	I. 72
Gross earn. per mile.....	7,524	7,407	L. 17
Oper. expen. per mile.....	5,718	5,651	L. 67
Net earn. per mile.....	\$1,806	\$1,856	D. \$50
Avg. rate per passenger per mile.....	2.099	2.057	D. 0.042
Avg. rate per ton per mile.....	0.683	0.705	D. 0.022

TRAFFIC.

Traffic Notes.

On Sept. 12 the Exposition Flyer carried 108 passengers from New York to Chicago.

The steamship "El Cid," of the Morgan Line, made the passage from New Orleans to New York last week in 4 days 2 hours and 15 minutes.

For the 24 hours ending at noon Sept. 19 the Pennsylvania lines delivered 5,029 passengers in Chicago. Of this number 2,476 arrived by regular trains from Pittsburgh and the East.

Commissioner Vandlingham of the Kansas City Transportation Bureau complains to the Western Passenger Association that St. Louis, Sedalia, Leavenworth and Des Moines have half fare excursion rates to their exhibitions, while Kansas City gets only a one and one-third fare.

A ticket broker at Denver, who is either very innocent or very bold, tells a reporter how employees' passes have come to be a prominent commodity in his line of business. The stagnation of business has compelled the discharge of a good many railroad employees, and these discharged men have left the road with passes in their possession. The roads have suddenly concluded to sharply scrutinize all passes presented, and the broker is therefore feeling troubled because he expects to have a dozen or so expire on his hands.

The Pennsylvania Railroad has carried more peaches this year than in any year since 1875. The Delaware district has shipped more even than in that year. The quantity shipped from points on the Delaware Division up to the end of last week, aggregated about 3,720,000 baskets or 6,200 cars. On Aug. 30, 321 cars were shipped. The number of baskets shipped to various cities is reported as follows: New York, 676,200 baskets; Philadelphia, 587,400; Boston, 244,800; Wilmington, 151,800; Pittsburgh, 67,800; Cleveland, 49,200; Chester, 40,600; Buffalo, 47,400; Providence, 34,200.

The New York Central has restored the New York and Chicago limited trains which were taken off a few weeks ago. The westbound train leaves New York at 10 a. m., but the time through to Chicago is 26 hours, instead of 25 as formerly. West bound the train makes connection over both the Lake Shore and Michigan Central. Eastbound it runs over the Michigan Central only, and the running time is 26 hours. The half-fare excursions to Chicago continue to run heavy. The Pennsylvania has proposed that the rate for these excursions, on the standard lines, be reduced from \$20 to \$15, but the other roads have not yet agreed to the proposition. Evidently the number of passenger cars released by the cessation of summer excursion business, on the Pennsylvania, is large.

Chicago Traffic Matters.

CHICAGO, Ill., Sept. 20, 1893.

Indications now are that passenger rates from California points are likely to be still further reduced, owing to recent action by the Southern Pacific in attempting to make eastbound rates from Southern California points via San Francisco the same as by the Atchison, Topeka & Santa Fe. Under its contract with the Southern Pacific the Atchison is accorded a differential of \$4 from Los Angeles. It is alleged that the Southern Pacific recently

offered the Los Angeles Board of Trade the same rate to Chicago via San Francisco as was offered by the Atchison. The Atchison promptly quoted a rate \$4 less, thus preserving its differential, and gave notice that it propose to preserve the differential on any rates that the Southern Pacific might make. The Eastern connections of the Southern Pacific at Ogden are extremely reluctant to prorate on reduced rates, and it may be that the S. P., finding itself obliged to stand the cut from its own proportion, may conclude that it will not pay. A reduction of \$15 on the one-way and round trip rate is announced by the Southern Pacific from points south of Mojave via El Paso. This reduction has been met by the Atchison. It is announced today that the Denver & Rio Grande will prorate with the Southern Pacific on reduced rates via Ogden. The Rock Island and the Burlington, being dependent upon the Rio Grande for their Western connection, may thus be forced into prorating.

The Southwestern Traffic Association is again threatened with disruption, this time on account of the action of the Missouri, Kansas & Texas, which has given the required 90 days' notice of withdrawal, alleging that its competitors are making secret cuts in Texas rates, which the machinery of the Association renders it impossible to meet as promptly as necessary. Of course there are three months intervening in which to fix the matter, but some of the members may conclude that, if it is to become necessary to "fix" things with each member every month or so, the Association would better go under at once. It will be remembered that the Missouri, Kansas & Texas, while Traffic Manager Waldo was in charge, brought about the death of the old association on the alleged ground that the expenses were too heavy and that no chairman was needed. At that time it was thought by some that it was a personal matter between the Missouri, Kansas & Texas and the chairman. Since that time the affairs have been conducted by a rate committee and a secretary.

The Great Northern has made arrangements with the Chicago, Milwaukee & St. Paul to run through sleeping cars between Chicago and Seattle. A rumor was current last week that the Chicago, Milwaukee & St. Paul would withdraw from its through service via the Northern Pacific, but this is denied by General Manager Earling, of the St. Paul, who states that his road has simply acceded the Great Northern the same facilities now enjoyed by the Union Pacific and Northern Pacific.

The Pennsylvania has put into regular service a second section of its Chicago and New York, Limited, to accommodate the demands of the heavy traffic on this train. Many of the roads are now compelled to run their regular trains in two and three sections. Since Sept. 17 the Monon has been running all its regular trains in two sections.

Chairman Caldwell has ruled that Western Passenger Association lines must refuse to honor excursion agency tickets sold in association territory, but that such tickets and orders sold at agencies without association territory may be accepted.

The Missouri Pacific demands that the rates made for the St. Louis Fair, Oct. 2-7, be made basing rates, and threatens that unless this is done it will in future negative any similar proposition applying to Chicago.

The Texas roads have advised all the roads in the United States that after Sept. 30 they will refuse to prorate with connecting lines on all tickets which are not printed with the new Texas anti-scalping clause, as required by law.

The Freight Committee of the Central Traffic Association has decided that whenever it is absolutely necessary to provide extra car doors for the loading of any class of bulk freight, they shall be furnished by the initial line and paid for pro rata by the roads carrying the consignment, the same as is now done in regard to extra doors for grain cars.

Notice has been given by the Central Traffic Association that from Oct. 16 that Association and all assenting lines in its territory will withdraw from arrangements with the Southwestern Traffic Association for through rates, arrangements and divisions to and from points in Texas and Mexico.

The shipments of eastbound freight, not including live stock, from Chicago, by all the lines for the week ending Sept. 16 amounted to 52,493 tons, against 52,236 tons during the preceding week, an increase of 257 tons, and against 63,751 tons for the corresponding week last year. The proportions carried by each road were:

Roads.	Wk to Sept. 16.		Wk to Sept. 9.	
	Tons.	P. c.	Tons.	P. c.
Michigan Central.....	6,043	11.5	7,030	13.4
Wabash.....	3,921	7.5	3,674	7.1
Lake Shore & Michigan South.....	9,265	17.6	7,885	15.1
Pitts., Ft. Wayne & Chicago.....	5,059	9.6	5,028	9.6
Pitts., Cin., Chicago & St. Louis.....	6,874	13.1	7,162	13.7
Baltimore & Ohio.....	3,324	6.3	2,956	5.7
Chicago & Grand Trunk.....	3,512	6.7	3,682	7.1
New York, Chic. & St. Louis.....	6,409	12.2	4,507	8.6
Chicago & Erie.....	6,323	12.1	7,335	14.0
C., C., C. & St. Louis.....	1,763	3.4	2,997	5.7
Totals.....	52,493	100.0	52,236	100.0

Of the above shipments 1,174 tons were flour, 19,140 tons grain and millstuff, 10,620 tons cured meats, 12,832 tons dressed beef, 1,548 tons butter, 1,192 tons hides and 2,527 tons lumber. The three Vanderbilt lines carried 41.3 per cent., the two Pennsylvania lines 22.7 per cent. The Lake lines carried 123,891 tons, against 83,248 tons during the preceding week, an increase of 38,643 tons.

(Other Chicago traffic news will be found on page 705.)

Coal Rates in Minnesota.

A complaint has been filed with the Minnesota Rail-road and Warehouse Commission alleging that the St. Paul & Duluth is charging excessive rates for carrying hard coal from Duluth to St. Paul and Minneapolis. For several years the rate on both hard and soft coal between these points was \$1.50 per ton. A few years ago, in order to aid the manufacturers of these cities, the tariff on bituminous coal was reduced to \$1 per ton, but there was no change in the rate on anthracite. Last winter there was an investigation by a committee of the Minnesota Legislature into all matters affecting the price paid for both grades of coal by the consumer. An unsuccessful attempt was made to secure the passage of an act reducing the tariff rate for transportation to 75 cents a ton. This complaint is an outgrowth of the work of that committee. There are three roads engaged in carrying coal between these points, but the St. Paul & Duluth is the only line entirely within the State of Minnesota. The Commissioners have set the hearing for Sept. 22.